DEPARTMENTS OF STATE, JUSTICE, COMMERCE, AND THE JUDICIARY APPROPRIATIONS FOR 1952

THURSDAY, APRIL 26, 1951

UNITED STATES SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D. C.

The subcommittee met, pursuant to recess, at 10 a. m. in room F–82, the Capitol, Hon. Pat McCarran (chairman of the subcommittee) presiding.

Present: Senators McCarran, Ellender, and Ferguson.

DEPARTMENT OF COMMERCE

PATENT OFFICE

STATEMENTS OF THOMAS F. MURPHY, ASSISTANT COMMISSIONER OF PATENTS; CARL E. HAGLUND, EXECUTIVE OFFICER; DONALD R. ELLIS, BUDGET OFFICER; W. A. STRIPLING, BUDGET EXAMINER, OFFICE OF THE SECRETARY; AND FRANK CAWLEY, BUDGET OFFICER, DEPARTMENT OF COMMERCE

SALARIES AND EXPENSES, JUSTIFICATION

Senator MCCARRAN. For the Patent Office the budget estimate is in the amount of $11,600,000, an increase of $250,000 over the current-year figure. Three pages from the justification will be placed in the record at this point.

(The justification referred to is as follows:)

Summary of requirements

Appropriation, 1951 (regular bill)	$11,500,000
Savings under sec. 1214	−150,000
Base for 1952	11,350,000
Net difference, 1952 over 1951:	

By activity	Requirements		Difference, increase (+) or decrease (−)	
	1951 (adjusted)	1952		
1. Legal counsel, appeals, and interferences	$428,140	$429,740	+$1,600	
2. Patent examining operation	6,395,680	6,444,680	+49,000	
3. Trade-mark examining operation	544,610	551,710	+7,100	
4. Patent and trade-mark services	3,560,830	3,751,530	+190,700	
5. Executive direction	80,790	81,090	+300	
6. Staff and administrative services	339,950	341,250	+1,300	
Total	11,350,000	11,600,000	+250,000	+250,000
Total estimate of appropriation, 1952				11,600,000

Summary of obligations by object of expenditure

	Actual, 1950	Estimate, 1951	Estimate, 1952
Personal services	$8,663,752	$8,770,000	$8,834,000
Travel	9,469	9,000	9,000
Transportation of things	2,634	3,000	3,000
Communication services	20,233	22,800	22,800
Rents and utility services	21,129	25,000	25,000
Printing and reproduction	2,069,843	2,296,200	2,482,200
Other contractual services	19,392	20,000	20,000
Supplies and materials	123,609	124,000	124,000
Equipment	92,684	80,000	80,000
Refunds, awards, and indemnities	291	0	0
Total obligations	11,023,036	11,350,000	11,600,000
Adjustments:			
Unobligated balance, estimated savings	+161,964	0	0
Savings under sec. 1214	0	+150,000	0
Appropriation or estimate	11,185,000	11,500,000	11,600,000

Summary of personal services obligations

	Actual, 1950		Estimate, 1951		Estimate, 1952	
	Average employment	Net cost	Average employment	Net cost	Average employment	Net cost
Personal services:						
Permanent positions (net)	1,994	$8,629,063	1,950	$8,769,800	1,900	$8,799,800
Regular pay in excess of 52-week base		33,183		0		34,000
Payment above basic rates (overtime, holiday pay, and night-work differential)		1,506		200		200
Total personal services	1,994	8,663,752	1,950	8,770,000	1,900	8,834,000

Senator McCarran. I notice the budget estimate of $11,600,000 contemplated the full-year employment of 1,900 persons, whereas for the current year you have 1,950.

Why is there a decrease in employment and an increase in funds requested?

CONTEMPLATED INCREASE IN ISSUANCE OF PATENTS

Mr. Murphy. The decrease in employment will be mostly due to the fact that we won't be able to recruit as we have during this current year. The increase in the funds will be taken care of mostly due to the fact that we expect to issue about 5,000 patents more in the next fiscal year than we are issuing this year. It costs about $37 per patent to issue one. That amounts to $186,000.

Senator McCarran. Why do you contemplate an increase in the issuance of patents?

Mr. Murphy. Because we are getting greater productivity now from our examining corps. Therefore we are getting out more disposals. We are getting rid of more patents.

Senator McCarran. Is it true, then, that as you reduce your personnel your product is greater?

Mr. Murphy. Not exactly. The reason for it is this: During the administration of Commissioner Kingsland we were a long ways

behind in dates, and as a result Commissioner Kingsland believed, and it is true, I think, that every applicant is entitled to know something about his application within 1 year of the date of filing his application. Therefore, he put great stress on the examination of new applications so that within 1 year an applicant would know something.

Senator McCarran. I should think we would know with that number of employees.

Mr. Murphy. Senator, in some divisions we were over 2 years and 2 months behind at that time. The last 16 months due to various things that we have done under Commissioner Marzall, we have the entire office now so that no division has any case older than 1 year. We are within 1 year on all cases.

PRESENT CASE LOAD

Senator McCarran. What is your case load at the present time?

Mr. Murphy. The case load is 111,000 applications on hand awaiting action by the examiner, and total in the hands of attorneys and examiners is about 205,000 applications.

Senator McCarran. That is quite a load, is it not?

Mr. Murphy. Yes. You see, we have them both awaiting action by the examiner and also awaiting action by the applicant.

The reason, I say, is that we have greater productivity with less employees, so we can act on every case as it comes along without stressing acting on new cases. It takes longer to act on a case the first time than it takes to act on a case a second, third, or other successive times.

Senator McCarran. On page 758 you recite applications pending, patents, excluding designs, 219,334, design patents 10,512, registration 37,730, renewals 899, republications 535. Is that your case load for fiscal 1950?

Mr. Murphy. That is the case load as it was at the end of fiscal year 1950.

Senator McCarran. On page 763 you show a comparison between 1950, 1951, and 1952 estimates.

Mr. Murphy. That is right.

Senator McCarran. New applications received, 1950, marked "Actual," 69,294.

Mr. Murphy. That is right.

Senator McCarran. The 1951 estimate, 70,000, the 1952 estimate, 70,000. Wouldn't you expect to get more during the war period than you do during peacetime?

Mr. Murphy. No. That was illustrated during the last war, where our incoming applications decreased greatly, the reason being that patent attorneys themselves were not available. They were in other things. The patent departments of corporations were depleted by their men going into the Armed Forces. So when we were in Richmond for the 5 years we got down at one point to where we had only 39,000 applications on hand awaiting action, and we grew from that for a year or two after the war to a grand total of 149,000 awaiting action. We have reduced that now to 111,000.

CASES DISPOSED OF DURING 1950

Senator McCarran. You disposed of 80,000 during 1950.

Mr. Murphy. That is right.

Senator McCarran. And 87,000 you estimate during 1951.

Mr. Murphy. That is right.

Senator McCarran. You have a higher estimate in 1952. You are making a big guess there, are you not?

Mr. Murphy. No. We can place our figures. You see, we can tell about disposals.

Senator McCarran. You are going to lose a lot of employees if this war continues, in my judgment. You will lose a number of your personnel because they will undoubtedly be called.

Mr. Murphy. We have taken that into consideration in our estimates for 1952. Of course, we can tell a lot about disposals because an issued patent results from an allowed patent. That is, today we will allow a case, and the attorney has 6 months to pay the final fee. Therefore, every week we allow a certain number of applications, every week we issue a certain number. For example, last Tuesday we issued 907 grants, the highest number was something like 2,550,000. The same week we probably allowed maybe a thousand.

Senator McCarran. How many did you allow last Tuesday?

PATENTS ISSUED EVERY TUESDAY

Mr. Murphy. We issued 907. That was the exact issue of last Tuesday. You see, we issue every Tuesday, regardless of whether Tuesday falls on the Fourth of July or Christmas, that is the date the patents are issued. The last Tuesday we issued 907. The law says the applicant has 6 months to pay the final fee.

Senator McCarran. How much is the final fee?

Mr. Murphy. Thirty dollars.

YEARLY AMOUNT RECEIVED IN FEES

Senator McCarran. Let me ask you, what is the intake in funds?

Mr. Murphy. About $5,800,000, and we estimate for next year $6,000,000. As we issue more patents we get in more final fees and of course the Treasury therefore gets a greater intake. We are estimating, for 1952, $6,000,000.

COST TO OPERATE OFFICE

Senator McCarran. It costs about $11,600,000 to run the office?

Mr. Murphy. That is right.

Senator McCarran. Why can't the fees be brought up to meet the overhead?

Mr. Murphy. The reason for that, Senator, I would say is that if we increase the fees to the extent to take care of this difference between $11,600,000 and the $6,000,000, we would stifle invention, and the small——

Senator McCarran. Do you think you would?

Mr. Murphy. I think we would; yes.

Senator McCarran. To an ordinary layman that wouldn't seem to follow.

Mr. Murphy. Yes, I suppose——

PATENT ON PAPER CLIP CITED AS EXAMPLE

Senator McCARRAN. A man may invent something that is very simple and looks like nothing at all, but he may make millions out of it. The paper clip that we use every day made millions for the fellow who invented it.

Mr. MURPHY. That is right.

Senator McCARRAN. It didn't cost him much to get that patent?

Mr. MURPHY. It cost him $30 to file, for the Government filing fee. It probably cost him $15 to have the drawing made. Depending on the attorney he had, it could have cost him from $150 to $350 for the preparation and filing.

Senator McCARRAN. How much does the inventor pay for the attorney's fee?

Mr. MURPHY. We know little about that except by hearsay.

Senator McCARRAN. You could make a pretty good guess.

Mr. MURPHY. I would guess in the paper-clip case it was about $150 for the attorney's fee for filing the case. On a calculating machine it might have been $350.

Senator McCARRAN. I suppose the attorney has an agreement on the revenue.

Mr. MURPHY. I understand that some attorneys do have agreements whereby they file cases on a contingent basis, but I think not too many attorneys do that. It might depend somewhat upon their appraisal of how valuable the invention is, which they themselves have searched as to novelty and so forth.

NUMBER OF PATENT ATTORNEYS

Senator McCARRAN. About how many attorneys have you practicing down there?

Mr. MURPHY. There are 6,000 attorneys in the entire country; about 550 of them in Washington and about 5,000 on our roster.

QUALIFICATION OF PATENT ATTORNEYS

Senator McCARRAN. You have prerequisites for admission to your bar?

Mr. MURPHY. Yes. We give an examination. We give that examination every 8 months, in fact three times every 2 years. In order to take the examination an attorney or an agent—in the case of an attorney of course he must be a member of the bar—he must have the prerequisite requirements which are about the same as we require for a young man coming into the office as a GS–5 examiner, that is, graduate of an engineering school or equivalent education. If he doesn't have that we allow him to take the examination, provided we feel that he has a chance of passing it. It is about the same as a bar examination, and we pass about 40 or 45 percent of those who take the examination.

PERCENTAGE OF PATENTS ISSUED OF APPLICATIONS FILED

Senator ELLENDER. About what percent of the applications filed result in the issuance of patents?

Mr. MURPHY. I think about 50 percent, Senator.

DISCUSSION ON INCREASING FILING FEE

Senator McCARRAN. I still go back to the thought, and dwell on it, that it might be brought up to that point, without any danger to inventions.

Mr. MURPHY. Of course there are some people who advocate the theory that there should not be any fee at all, that invention should be stimulated without any cost, but I think a happy medium can be struck. Certainly if there were no fees at all we might have a great many useless applications.

Senator McCARRAN. You would be swamped with a lot of stuff which amounted to nothing.

Mr. MURPHY. That is right. But if we had higher fees, possibly the larger corporations wouldn't have any trouble filing their applications, but the small garret inventor would, of course, be discouraged.

RELATION OF PATENT OFFICE WITH OTHER DEPARTMENTS

Senator McCARRAN. What is the relation between the Patent Office and the patent sections of other departments, such as Agriculture, Air Force, Army, Navy, and so on?

Mr. MURPHY. They have the same relation to us as the patent section of the General Electric or Westinghouse has, that is to say, they prosecute applications before us for inventions possibly invented by employees of those departments. Say, for example, that an employee of the Commerce Department makes an invention in the improvement of a sorting machine for use in the Census Bureau, that would be prosecuted by them before the Patent Office, a bureau of Commerce, by attorneys from the Department of Justice. In my own experience of 20 years as an examiner of patents I have handled cases that way that were prosecuted for Commerce and invented by an employee of Commerce, a sorting machine for use in the Census Bureau.

Senator McCARRAN. Why cannot all patent work be so centralized in the Patent Office?

Mr. MURPHY. You see, Senator, there are two sides to a patent application. It is the same as the prosecuting attorney and the attorney defending a defendant. That is, the work on the outside is all done by patent sections of various clients, that is to say, in this case, the Navy Department is a client of its patent section, and they are asking the Commissioner of Patents for a patent. They are one of our customers, you might say. It is all centralized. It actually is. No one issues patents except the Commissioner of Patents.

Senator McCARRAN. You issue all the patents?

Mr. MURPHY. Yes.

Senator ELLENDER. Does the department of Government pay the same fees as private litigants?

Mr. MURPHY. Usually we find, to our detriment, sometimes more, and they recruit some of our men away from us. We have lost in the last several months a number of examiners, mostly in grade GS–9. They will receive an offer from, say, Navy, Navy Ordnance, Navy Research, and a job doing just the other side of the work there, prosecuting the case instead of examining it. They are probably given one grade higher over there. I think that is true.

QUESTION OF ATTORNEYS LEAVING PATENT OFFICE PROSECUTING PATENT CASES

Senator McCarran. Does that fellow who was taken from you and goes over to the Navy Department follow a case through your office for a patent?

Mr. Murphy. Yes. Of course he can't prosecute any case with which he has had any connection while he was in the Patent Office for 2 years after he leaves the office.

Senator McCarran. He comes back from the Navy Department with all the knowledge that he gained in your department.

Mr. Murphy. He goes to the Navy Department with knowledge he gained in our department, that is correct, but he can't use that knowledge for 2 years, and by that time we expect that the pending cases will be disposed of.

Senator McCarran. Is that strictly true? Isn't it a fact that he can't prosecute a case or indulge in a case in which he was involved in the Patent Office, but he can come in with a brand-new case from the Navy Department 3 days after he is employed.

Mr. Murphy. Not if that case is classified in a class which is in the same division in which he worked while he was in the Office. I was for 15 years in the Division of Calculating Machines. If I went out to the Navy Department and took a job there I couldn't prosecute a calculating-machine case for 2 years. If I went with the IBM or any other company I couldn't prosecute a patent application for 2 years.

Senator Ellender. You could prepare it.

Mr. Murphy. No, indeed.

Senator Ellender. I mean for somebody else to prosecute.

Mr. Murphy. If he does that of course we have no control over that. But he signs an oath that he will not prosecute a case before any Division in our Office in which he was employed for 2 years.

Senator Ellender. That is, if he does it himself. Still he could prepare it for someone else to prosecute.

Mr. Murphy. We would have no way of knowing that, Senator.

COMMITTEE TO COORDINATE ALL PATENT WORK

Senator McCarran. Are you working with the committee that has been set up to coordinate all patent work?

Mr. Murphy. I think that Mr. Federico, a Board of Appeals member in our Office, is working on that coordinating committee.

Senator McCarran. What has that in contemplation, if you know?

Mr. Murphy. I think that contemplates some changes in the patent statutes. There have been some bills that have been presented. I think Congressman Bryson's committee has prepared a bill in which they were attempting, I believe, to define what is invention, for one thing.

Senator McCarran. Did you have a statement that you wanted to file?

STATEMENT OF COMMISSIONER MARZALL

Mr. Murphy. Yes; I have a statement here that Commissioner Marzall would have made if he were able to be here this morning. I talked to him on the phone this morning. He has been ill for 2

weeks, quite seriously ill, with virus flu and pleurisy. This statement is a very comprehensive one and explains it very well. I would like to submit it for the record.

Senator McCarran. Very well, it will go in the record.

(The prepared statement is as follows:)

STATEMENT OF JOHN A. MARZALL, COMMISSIONER OF PATENTS

The budget requirements of the Patent Office for fiscal year 1952 amount to $11,600,000 for continuing the program of examining patent and trade-mark applications and related work of the Office incident to administration of the patent and trade-mark laws. These requirements are limited to funds for personal services sufficient to continue the program at about the same level as authorized for 1951 and for other necessary operating expenses, most of which are directly governed by the volume of patents issued and trade-marks registered. Our total requirements may be divided into three major parts:

(1) 76% for personal services
(2) 21½% for printing and reproduction
(3) About 2½% for all other expenses

Of the $11,500,000 appropriated for fiscal year 1951, $150,000 has been reserved for savings under section 1214 of the General Appropriation Act, 1951, leaving a balance of $11,350,000 available. The increase of $250,000 in 1952 over the base requirements of $11,350,000 available for 1951 is comprised of $186,000 for "printing and reproduction" and $64,000 for "personal services." In viewing the elements which make up our increased requirements, it must be recognized that the Office is faced with increasing liabilities of a fixed nature in spite of the fact that our program is continued at about the same staff level of operations. These liabilities arise due to (1) the increasing productivity of the Office which results in the need for publishing a greater number of patents and (2) the necessity of conforming with existing legislation relating to compensation of employees.

The increase of $186,000 for "Printing and reproduction" provides for printing requirements related to an increase of 5,000 in the estimated number of patent issues for 1952, the inevitable result of increased productivity by the Office in its efforts to reduce the huge backlog of patent applications. This includes printing of patent specifications and drawings and publication of the issued patents in the Official Gazette and annual indexes, the combined cost of which averages a little better than $37 per patent.

Total increased costs for "Personal services" in 1952 include $100,000 for statutory within-grade salary advancements; $34,000 for 1 day's pay in excess of the 52-week base; and $160,000 for continuation of the examiner salary program authorized for the previous 3 years, or a total of $294,000. Of this amount, it is estimated that $230,000—or about 78 percent—will be offset by savings in the "Personal services" item arising as a result of increased turn-over lapses, leaving a net increase of only $64,000 in personal-service requirements. In consideration of the probable effects of the state of emergency on the ability of the Office to replace promptly those employees who will be lost through turn-over, we are anticipating in the budget that the lapse rate for 1952 will be about double the rate for the current year.

During 1950 for the second successive year we have been able to dispose of a greater number of applications than the number of new applications received. With no increase in the number of examiner assistants, in comparison with fiscal year 1949, we show for 1950 an increase of 18 percent in total patent-application disposals (80,141, as compared with 67,935 for 1949) and an increase of 27 percent in the number of patents issued (38,683, as compared with 30,564 for 1949).

We estimate that intake of new patent applications will continue at the rate of about 70,000 per year. Under the program encompassed by the budget estimate, we expect to realize the disposal of about 96,000 applications for 1952. This will mean a margin of 26,000 disposals, or about one-fourth of the expected productive capacity, to apply against the backlog. Approximately three-fourths of total production will merely offset the intake of new applications. With increased disposals, there will be a relative increase in the number of patents to be issued, which are estimated at 50,000 for fiscal year 1952. The backlog of patent applications awaiting disposal is expected to decrease to about 176,000 by the end of fiscal year 1952 if the present program is continued at the level provided for in the budget.

Processing of applications for renewal and republication of trade-marks is expected to continue on a current basis, with a volume of about 4,000 renewals and 2,000 republications. The backlog of applications for registration of marks is being reduced at the rate of about 7,000 per year. A continuation of this production rate in 1952 will reduce the backlog to about 24,000 by the end of the year, with intake of new applications continuing at the current rate of 18,000 per year.

Fees established by or pursuant to law for filing of applications, issue of patents, sale of patent and trade-mark copies, and other services furnished by the Office produced $5,448,000 in revenue during 1950, and are estimated to produce $5,800,000 in 1951 and $6,000,000 in 1952. All income received by the Office is covered into the Treasury as miscellaneous receipts.

Senator McCARRAN. Have you anything you wish to say on your own?

Mr. MURPHY. The only thing I have to say on my own, Senator, is this: It is probably on the same question that you raised, how we can produce and dispose of more applications without using more employees—as a matter of fact, using less—greater efficiency. One of the reasons is that in the last 16 months since Commissioner Marzall has been there, we have been able to reduce the number of cases pending from about 135,000 at the time he came in to about 111,000 at the present time.

Senator McCARRAN. How did you do that?

ESTABLISHMENT OF COMMISSIONER'S EXAMINERS DIVISION TO EXPEDITE WORK

Mr. MURPHY. One method is this: We established a new division, called the Commissioner's Examiners Division. We have 70 divisions in the Office. If we could have all the work spread equally among all those divisions they theoretically all should be just about the same distance behind in time in reaching applications, but some divisions of course have more difficult cases than others. Therefore, if we can give more cases to one division and less to another, we could balance those workloads, but we find on account of space requirements that we can't put more into a division because we don't have the physical space. Therefore, we set up this Commissioner's Examiners Division and adopted the policy of taking the division in the lowest in the order of standing as to dates and taking some of the art away from that division.

Take Division 61, which is the first division we worked on. They have two or three different kinds of things they act on. They act on horology, that is one class. Timing devices is the second class. They also act on what we call winding and reeling. They also act on what we call pushing and pulling devices. Those are unrelated things. It would be nice if they weren't put together, but we have to do it. We took one of those classes directly out of that Division and reduced the Division's workload from possibly 2,800 cases down to maybe 2,200 cases, transferred this art into a new section where we took some space from our public search room, and put 12 experienced examiners in there with a chief, and we started to work on that new class—that pushing and pulling class. Those 12 examiners were concentrating in that one class. The remainder of the examiners in Division 61, not having to work on that class, were operating on other classes, and were able to push the dates up so that we reduced the waiting time materially. Our figures show that on November 30,

1949, we had 5 divisions that were over 2 years behind, we had 33 divisions over 18 months behind, and 44 divisions over 15 months behind.

ESTABLISHING INDIVIDUAL PRODUCTION STANDARDS

Senator McCarran. Why can't you set a standard whereby each individual must get out a certain load of work?

Mr. Murphy. We do sort of unofficially have such a standard. We have followed what we call complexity factors; that is, we know it takes less time to act on a case filed on a paper clip than it does on a calculating machine, but it probably would not be a good thing to say to an examiner, "Here, we are putting you on a quota system. You must get out a certain number of cases." But we do have those standards, and examiners are not promoted unless they meet the standard for that class. For example, in Division 6, which is a chemical division, we require at least 10 actions per week per examiner. In Division 23 we probably require only about 6. That is the division that has calculating machines.

SCOPE OF PATENT EXAMINATION

Senator Ferguson. Are these examinations to determine whether or not there is a former patent of the thing as to whether it is patentable?

Mr. Murphy. Yes. It is first to determine whether there is a former patent, which is prior art; former publication, which is novelty; to see whether the thing is new; then again to see whether there is any invention there, to find whether or not it is patentable; and to find out whether or not the device is useful. The statute says it must be new, useful, and involve invention.

Senator Ferguson. How far are you behind on those cases? If I filed an application today, when would you get to it?

Mr. Murphy. If you filed in some divisions we could get to it in about 6 months, but it would be no later than 11 months and something like 28 days. We are within 12 months on all cases now, whereas 16 months ago in many divisions, in fact five, we were over 2 years and 2 months behind. We have all cases now within 1 year.

AVERAGE CASES PER WEEK PER EXAMINER

Senator Ferguson. You say these men get out only about 10 or 12 cases a week?

Mr. Murphy. The average is 8.2 actions per week per examiner. I was an examiner myself for 15 years, so I know.

Senator Ferguson. Don't you have indexes and means of finding prior patents along this same line?

Mr. Murphy. Oh, we have every patent.

Senator Ferguson. This man Hoover will get you in an hour by fingerprints. Are you familiar with his indexing and cross indexing?

NUMBER OF INVENTION CLASSIFICATIONS

Mr. Murphy. Yes. We don't have any mechanical searching, that is to say by punch cards, yet. All our patents are classified into 320 different classes of invention.

Senator FERGUSON. That is what I am getting at.

Mr. MURPHY. Every one of those classes has anywhere from 10 to 150 subclasses.

Senator FERGUSON. That is almost one a day. It is a man a day to see whether or not a thing is patentable.

Mr. MURPHY. Yes.

FURTHER DISCUSSION ON INCREASING FILING FEE

Senator FERGUSON. If that is true, why don't you charge for it?

Mr. MURPHY. Senator McCarran just asked that question. We expect to take in $6 million and our costs are $11,600,000. Our fees now are $30 for filing an application and $30 for the final fee, $60. The question is, Why don't we make it $120, and that would make us operate even. My answer to that, which I believe is the right answer, is that we would stifle invention if we raised fees any more.

Senator MCCARRAN. Do you not think that by raising the fees you would accomplish another angle? You answered Senator Ellender that you grant about 50 percent.

Mr. MURPHY. About 50 percent of all applications filed.

Senator MCCARRAN. You find 50 percent are frivolous anyway, a haphazard proposition, some fellow making a try at it. If he had to pay $60 to file and $60 for his patent, maybe he wouldn't be so anxious.

Mr. MURPHY. I wouldn't say that a great percentage of them are frivolous. Many times it is just small steps forward that give us the great final step forward and give us our industrial greatness that we have today.

Senator FERGUSON. I don't think you would stifle it at all.

Senator MCCARRAN. I doubt it very much myself.

Senator FERGUSON. I think if you would open it free—

Senator MCCARRAN. It would run them ragged.

Senator FERGUSON. It would just run you ragged. I think this is the kind of service really that should pay.

Mr. MURPHY. Of course, of the cost of actually prosecuting a patent application, the Government fee is probably only a small part. That is $30 to file the case and possibly an attorney's fee.

Senator FERGUSON. Sure. He pays his outlay.

Mr. MURPHY. Then the $30 final fee, which is sometimes termed "the publication fee."

Senator Ferguson. The lawyer then will be careful in his advice if he is going to have to pay $60 of the man's money to see whether or not this thing is patentable.

Senator MCCARRAN. Where do you get your statutory direction as to your fees?

Senator FERGUSON. Yes. Is that compulsory?

Mr. MURPHY. The rules I think provide for the fees.

FEES FIXED BY STATUTE

Senator MCCARRAN. It is regulations and rules and not statutory?

Mr. HAGLUND. It is statutory; yes, sir.

Senator MCCARRAN. It is fixed by statute?

Mr. HAGLAND. We can supply that for the record, but it is by statute.

Senator MCCARRAN. Is the amount fixed by statute?

Mr. MURPHY. Yes.

Senator FERGUSON. It is by statute?

Mr. HAGLUND. Yes. We will supply that for the record, Senator.

Senator MCCARRAN. I think you had better give us that for the record.

(The information requested follows:)

Patent fees, fixed by statute, including the filing fee of $30 and the issue fee of $30, are set forth in section 78 of title 35, United States Code. Trade-mark fees fixed by statute are set forth in section 1113 of title 15, United States Code.

LEGAL COUNCIL, APPEALS AND REFERENCES

Senator MCCARRAN. "Legal counsel, appeals and interferences"—in 1951 you had $428,140. In 1952 you want $429,740. You want a $1,600 increase there. How many attorneys have you?

Mr. MURPHY. We have first to count our Solicitor's office. We have the Solicitor and four lawyers. They represent the Commissioner in court in suits filed against the Commissioner. They also represent the office in appeals taken to the Court of Customs and Patent Appeals.

Senator MCCARRAN. What does this mean over on page 762, under estimate 1952? Does that mean 78 positions?

Mr. MURPHY. Yes.

Senator MCCARRAN. What does 75 mean?

Mr. MURPHY. Seventy-five average employment. The explanation there is that this activity provides legal and quasi-judicial facilities—

Senator MCCARRAN. You are calling for 78 positions there.

Mr. MURPHY. Seventy-eight positions; yes.

Senator MCCARRAN. That is the same as you have now.

Mr. MURPHY. Yes.

Senator MCCARRAN. What does that mean, employment?

Mr. MURPHY. Average employment means the number of employees that are on for a full year, the number of employees that are working there for a full year.

Senator MCCARRAN. Why 78 positions and 75 employees?

Mr. MURPHY. Why do we have that difference?

AVERAGE PERSONNEL

Senator MCCARRAN. Seventy-eight positions are authorized, and seventy-five are filled.

Mr. HAGLUND. We maintain average employment of 75.

Senator MCCARRAN. Is that a correct construction of it?

Mr. MURPHY. That is correct, Senator, yes.

Senator MCCARRAN. How about your regular pay in excess of 52 weeks, another $1,600?

Mr. MURPHY. That is that extra 1 day.

Senator MCCARRAN. I have heard about that.

Mr. MURPHY. I heard about that for the first time yesterday.

AMOUNT FOR SUPPLIES AND EQUIPMENT

Senator MCCARRAN. "Other objects"; what does that mean? For 1951 you had $9,665, and for 1952 you want $9,665. What does "Other objects" mean?

Mr. MURPHY. That is supplies, equipment, and so forth, paper, paper clips, ink, and all the rest of the office equipment we need to run the office.

Senator MCCARRAN. You have that under legal counsel. That is equipment for the offices of your legal counsel, the other objects?

Mr. MURPHY. Yes; the Solicitor's office, the board of appeals, our various interference boards. You see, we have not only patents, but trade-marks. We have a trade-mark interference division as well as a patent interference division, a board of appeals, and then of course under legal services the Solicitor's office. That takes up 78 employees, including clerical.

Senator MCCARRAN. Going into patent examining operations——

Senator ELLENDER. May I ask a question, Senator?

Senator MCCARRAN. Surely.

PERCENTAGE OF PATENTS RESULTING IN LITIGATION

Senator ELLENDER. With respect to the Legal Division, how often does it happen that the patent which is issued by you is contested?

Mr. MURPHY. Of course, that is something that we have no control over.

Senator ELLENDER. I understand that.

Mr. MURPHY. I know Commissioner Kingsland said that about 2 percent of the issued patents actually get into litigation.

Senator ELLENDER. Are they subject to the jurisdiction of the regular courts under the law?

Mr. MURPHY. Yes. When the grant is made to an inventor, the patent gives him the right to go into the Federal courts.

Senator ELLENDER. You say about 2 percent of those are contested?

Mr. MURPHY. I understand 2 percent of them finally end in litigation.

Senator ELLENDER. Why should you defend it?

Mr. MURPHY. We don't defend those. Our defense comes like this: Say that a man applies for a patent and we turn him down in the Examining Division, and he then appeals to our board of appeals and if we still persist in turning him down, then he has two remedies. If he wishes, he can go to the Court of Customs and Patent Appeals on direct appeal or he can file a bill in equity under section 4915 Revised Statutes as we call it, and go to the district court. There instead of its being an appeal, it is a new action in which they go into the court and say, "the Commissioner of Patents wouldn't grant us a patent and I want to have you tell him to do so."

Senator ELLENDER. That is on your refusal to do so?

Mr. MURPHY. That is right.

Senator ELLENDER. But on patents that have been issued by you?

Mr. MURPHY. That is something else. That litigation is different altogether.

Senator ELLENDER. You don't have anything to do with that?

Mr. MURPHY. We don't have anything to do with that at all. We start the thing by issuing the patent, of course.

Senator ELLENDER. You say 2 percent of your patents issued are set aside?

Mr. MURPHY. No. Only 2 percent of issued patents get into litigation. The figures as to how many are held invalid and infringed, I don't know.

HANDLING OF PATENT APPLICATIONS RELATING TO WAR EFFORT

Senator FERGUSON. Have you any way of sorting these cases as they come in so that you can take care of the patents in relation to our war effort?

Mr. MURPHY. Yes; we do. We have one division, Division 70—do you want to have it off the record, possibly?

Senator FERGUSON. If you think it ought to go off the record. You have 50 percent of the applications not granted. I am interested in knowing whether or not there isn't some way that your men at the beginning, as we have to do with our mail at the present time, can take care of the important things and the less important later. I know that people will say that isn't fair, but it is if you are dealing with the war effort. So you can get their patents through and let the delaying go with the frivolous things. Your men surely can tell at first glance whether or not a thing is in the realm of being patentable or outside of that realm. I realize you have to make a search.

APPLICATIONS MADE SPECIAL

Mr. MURPHY. We can take up applications, as we call them, special, if we think they are important to the defense or for any other reason. We have a regular procedure whereby we get a petition to make special and we can take a case up right away and we do it. We grant probably 200 of those petitions a year. There are two other reasons that we do it, too. If it happens that a man has an application pending and it is being infringed, he can petition, and we do the same thing, if he makes a proper showing. The second thing is that if a man has an application pending where there is going to be a great development as a result of manufacture and a lot of people put to work and so forth, we can grant a petition to make special on that ground. The third is applications which are for public benefit. In that case a Cabinet officer must request that the application be made special and he must appoint someone to see that the patent is not improperly granted. The statute calls for that. Then again we do have, as you say, a way of sorting. We have a division, Division 70, which is our security division, in which all applications which come under secrecy are classified.

Senator FERGUSON. Your bar as I call it which is practicing before you, has to have certain qualifications as you have stated, and they have to be admitted to the bar.

Mr. MURPHY. They have to be admitted to practice before our office. They receive a certificate and a registration number.

Senator MCCARRAN. Do they make a payment for the privilege?

Mr. MURPHY. No payment except the $5 at the time they are registered to cover the cost of various things.

Senator MCCARRAN. The examination is conducted without fees?

FURTHER QUESTION ON QUALIFICATION OF PRACTITIONERS BEFORE PATENT OFFICE

Mr. MURPHY. Yes. The examination is conducted by the Civil Service Commission, and we prepare the examination in the office. I am Chairman of the Committee on Enrollment. We prepared the examination. We have 35 questions. Then we have claims that we require the applicant to write. Then we rate the examinations ourselves. The Civil Service Commission conducts the examination and conducts it in such a way that we don't know who the applicant is, since numbers are assigned to each candidate. We rate them and we have a procedure whereby if they are close in passing we re-rate them and then we will also re-rate them on petition afterward.

Senator FERGUSON. You mean they have to take an examination?

Mr. MURPHY. To become registered to practice before the Patent Office you must take an examination.

Senator FERGUSON. I understand they are very meticulous about that.

Mr. MURPHY. It is the same as the bar, Senator. It is about the same thing.

Senator ELLENDER. And the Treasury.

Mr. MURPHY. And the Treasury, as I understand it, yes.

Senator FERGUSON. Do you get through lawyers 50 percent of the patents that are not patentable?

Mr. MURPHY. I would say, Senator, that about 50 percent of patent applications are finally held not patentable.

Senator ELLENDER. Applications filed.

Senator FERGUSON. And not granted. That is what I mean.

Mr. MURPHY. That is to be expected, Senator.

Senator FERGUSON. Don't lawyers come in and make their own searches?

Mr. MURPHY. They do. They make a pre-examination search of the prior art, and therefore they are convinced before they file a case that the case is patentable, but it turns up many times, of course, that it isn't.

LARGE CORPORATIONS EMPLOY OWN SEARCHERS

Senator MCCARRAN. Some of the larger corporations in the country like General Motors and the like have their own private searchers, do they not?

Mr. MURPHY. There are very few that have all the material. Some of them do have a library of patents, like maybe duPont, but they just have it for the classes in which they are interested.

Senator MCCARRAN. Do they not have searchers right down in your office?

Mr. MURPHY. Yes, they have their own patent department right here in Washington and they come to the office every day. We have, I guess, 1,000 people in there a day searching in the public search room. DuPont has its patent section here also.

Senator MCCARRAN. That is a service that is granted to them gratis; is it not?

Mr. MURPHY. We have the room there available, and we have the patents to be searched.

Senator MCCARRAN. The files are open to them.

Mr. MURPHY. Oh, yes; the files are open to the public.

QUESTION OF MAKING OFFICE SELF-SUPPORTING

Senator MCCARRAN. I tell you frankly why I am asking these questions. I would like to find a way to make this thing break even some time or other.

Senator FERGUSON. Why should it not pay? We have a clerk's office where if they want to file they pay a fee for getting it filed. That is the way to make it support itself.

Mr. MURPHY. Of course libraries don't charge for people to come in and consult and do work there. That is what the Patent Office search room is, a library, and many times people come in there to search not to find out about filing an application, but maybe to find out the state of the art to see what they can do themselves in manufacturing. Of course, after 17 years the patent grant that was given to the inventor, reverts to the public. He should know. He shouldn't have to pay to go in there and find out what he can do.

Senator FERGUSON. How many agents has the Soviet Embassy in our Patent Office? I mean coming in and using this public library?

Mr. MURPHY. Anyone can come into the Patent Office Search Room.

Senator FERGUSON. Do they have representatives there making searches?

Mr. MURPHY. We have no way of knowing that.

Mr. HAGLUND. They could have, but we don't keep a tally on who comes in to use the search room, so there is no way of knowing.

Senator FERGUSON. What does it cost to operate that search room? You talk about free library service. The law libraries charge a big fee.

(The information requested follows:)

The cost of operating the public search room in the Patent Office is approximately $65,000 per year.

Mr. MURPHY. I don't think it is like a bar library, Senator. These are public records.

Senator FERGUSON. But they are used by specialists.

Mr. MURPHY. They can be used by anyone.

Senator FERGUSON. I know it can be.

Senator MCCARRAN. But the Government paid for setting those records up. Somebody had to set them up.

Mr. MURPHY. You mean the difference between our $6,000,000 and $11,600,000 the Government paid, yes. Of course that final fee is supposedly the publishing fee. That $30 at the time we issue a patent.

Senator MCCARRAN. It must cost money to make your brochures and your files.

Mr. MURPHY. Yes, we have to take our patents and mount them as hard copies and maintain them.

Senator FERGUSON. The man doesn't go himself and pull the file out.

Mr. MURPHY. Sometimes they do.

Senator FERGUSON. Do you not have clerks in there?

Mr. MURPHY. The searcher goes right in there, yes, and takes out what he wants to search, and then our people put them away.

Senator FERGUSON. You have to have help there.

Mr. MURPHY. We have to have help there, yes.

Senator FERGUSON. I see.

Senator MCCARRAN. What protection have you if a searcher goes in there and pulls out a file? What protection have you as to their being purloined?

Mr. HAGLUND. We have had that checked recently, Senator, and the loss is very small as to missing numbers.

Senator FERGUSON. They do carry them out.

Mr. MURPHY. They rely on each other not to take them out.

Senator MCCARRAN. They could take them out and photostat them.

PHOTOSTATED COPIES OF PATENTS AVAILABLE

Mr. MURPHY. It would be cheaper to buy a photostatic copy or a copy of a patent. You can buy them right there for a quarter, you see.

Senator ELLENDER. Do they have access to the original?

Mr. MURPHY. Oh, no. The original, of course, is mailed to the inventor. He receives it. The applicant receives the original of the patent.

Senator MCCARRAN. There is a copy of the patent in there.

Mr. MURPHY. Yes. First we have a bound volume in which they are kept forever. He couldn't get that, of course. Then we have a copy arranged by classification set-up in the public search room. Then we have another copy which is in each one of the examining divisions, the particular examining division.

Senator ELLENDER. That is of each patent issued?

Mr. MURPHY. Of each patent issued.

Senator ELLENDER. What about the original data?

Mr. MURPHY. That is the patented file. That remains in our office, and when they get that they have to put in a request and a charge, and then it is issued to them, and they can look at it in what we call the attorney's room, which is a part of our search room.

Senator ELLENDER. Do you charge for this service?

Mr. MURPHY. No charge. By charge I mean if I wanted one, for example, I would go in to Mr. Stoner and tell him I would like to see the patent file of Patent No. 2,550,000 and he sends downstairs and gets it and I fill out a slip and it is charged to me. I look at it there. If I want I can have a certified copy made of that and we charge them then 20 cents a page for each one of those pages that we photolithograph for them plus a certification fee of 50 cents.

Senator ELLENDER. Do they have free access to the original files or is it under direction and supervision?

Mr. MURPHY. It is under our supervision.

Senator FERGUSON. Have you raised the rates of these various things that you are talking about for 20 cents a page, the certificate charge and so forth, in proportion to the increase in the pay of your employees, or are we charging the prices you charged 20 years ago?

Mr. MURPHY. It is just about 4 years ago that we raised the price of patent copies from 10 cents to 25 cents. It is soft copies that we are talking about.

Senator FERGUSON. We have been talking about this in the Judiciary Committee for years, and the chairman has urged this for years. There seems to be always a resistance in the Patent Office on charging, on getting your fees sufficient to carry it. You furnish them an attorney's room. Here are many big companies using this facility who pay nothing for it. I just don't think we are on the right track on some of these services.

Senator MCCARRAN. I think that your patent examining operation as shown here is the most expensive facility.

Mr. MURPHY. Yes.

Senator MCCARRAN. Your allowance was $6,395,680 in 1951, and you are asking for $6,444,680 for the coming year, an increase of $49,000. How do you account for that? I am dwelling now on patent examining operation.

PAY AND PROMOTION OF EXAMINERS

Mr. MURPHY. The increased cost for personal services. One item is $100,000, the statutory within-grade salaries advancements. Then, of course, that same $34,000 comes back in there for that 1 day's pay. Then $160,000 for the continuation of our examiner salary program. We used to have a system whereby an examiner came into the Office at the first rate, P–1, and he stayed there a certain number of years before being promoted to P–2, and a certain number of years more for each further promotion. We have accelerated that time in order to keep our men and keep them from leaving us after we train them. We bring a young man in the Office as a GS–5 (formerly P–1) at $3,100, and after 6 months if he produces and does the work all right he goes to the next examiner grade which is GS–7, which is around $3,800. After 2 years in the Office if he is all right he goes to GS–9, which is $4,600. Then after 4 years if he is all right he goes to GS–11, which is $5,400. Finally after 8 years, when we think he has reached the top or the journeyman's rate, as we call it, he goes to GS–12, which is $6,400.

We have cut down the length of time for an examiner to wait for advancement to those higher grades to keep them with us, because it takes about 5 years for an examiner to reach his full productivity. After 2 years he is very valuable to us, and the money we have spent the first 2 years we will have lost if he leaves and goes to duPont or General Motors or the Naval Research Laboratory or anywhere else. Therefore, we need that money, $160,000, to keep that program going and keep our organization together.

That is a total of $294,000, those three items. But we are absorbing $230,000 of that $294,000. We are saving $230,000 due to the fact that we will have more lapses. So actually our net increase is $64,000 for personal services.

PATENT AND TRADE-MARK SERVICES

Senator MCCARRAN. I notice that patent and trade-mark services is your next highest, $3,560,830 for 1951, and you are asking $3,751,530 for 1952. That is an increase of $190,700.

Mr. MURPHY. Yes.

Senator MCCARRAN. Why is that?

Mr. MURPHY. This is where all our printing is, you see.

Senator MCCARRAN. It says trade-mark.

Mr. MURPHY. Printing costs for trade-marks as well as patents. The printing bill comes to $186,000 for the 5,000 extra patents that we expect, and at $37 per patent the printing bill runs mighty heavy.

MEMORANDUM SUGGESTING RAISE IN FEES

Senator FERGUSON. How big a job would it be to get a memorandum up showing how much you believe you could raise these fees to cover the cost, so we could consider whether or not such a bill ought to be considered?

Mr. MURPHY. I guess it wouldn't be much of a job to get up a memorandum as to how much it should be increased.

Senator FERGUSON. If you were asked to put that in shape, what would you recommend to this committee?

Senator ELLENDER. It would be about 100 percent more.

Senator FERGUSON. They might recommend where it should go. They know what is being done down there. For instance, they pay $5 to be admitted now. They pay $25 over in the Supreme Court. They have only one case probably and are perfectly willing to pay $25 to be admitted.

Senator MCCARRAN. If it was $50, it would be just the same.

Senator FERGUSON. It would be just the same.

Mr. MURPHY. I think we probably have some material on that question, Senator, from which we can prepare something.

Senator MCCARRAN. I would like very much to have some information along that line.

Senator FERGUSON. Will you supply that and put after it, "This fee is now statutory," so that we would know whether it could be done outside of the statute or in the statute?

Mr. MURPHY. That law is title 35, United States Code, section 78.

Senator FERGUSON. I have just been looking at it.

(The information requested appears on p. 668.)

PERSONNEL REQUESTED

Senator MCCARRAN. In your "Patent and trade-mark services" you have "Permanent positions"; in 1951, now, you were allowed 395, and you have now employed 384, and you are asking for 395 for the oncoming year.

Mr. MURPHY. Yes.

Senator MCCARRAN. You figure you want only 375.

Mr. MURPHY. That is 375 average employment.

Mr. HAGLUND. The reason for that is that there is a longer lapse and delay in filling those positions. You have to scratch to find personnel today. It is very difficult to get stenographers and typists, and we do have a little more lapse today than we have had in the past.

COSTS FOR PRINTING OF PATENTS AND TRADE-MARKS

Senator MCCARRAN. You have "Other objects" down here. You have $2,383,220 for 1951. How is that expended?

Mr. MURPHY. That includes, of course, the printing of patents and trade-marks. That is the principal item of the increased cost of $186,000.

Senator MCCARRAN. Where do you get your printing done?

Mr. MURPHY. The Government Printing Office.

DISCUSSION REGARDING COMPARISON OF CHARGES FOR PRINTING BY GPO AND COMMERCIAL PRINTERS

Senator MCCARRAN. Let me ask you something. Did you ever try printing on the outside?

Mr. MURPHY. Mr. Haglund can answer that. We never have tried it, of course.

Mr. HAGLUND. We went into that in considerable detail this past year, and the Government Printing Office gave quite a bit of study to the whole field. They are in the process now of making certain changes which will give us some economies in our printing costs.

Senator FERGUSON. Have you ever had bids from the outside to see how much higher the Government Printing costs are?

Mr. MURPHY. We can't get bids from the outside because all the printing problems are handled by the Government Printing Office.

Senator MCCARRAN. You never made a search of the thing to see whether or not under the bidding system you could probably get the same work done on the outside for less?

Mr. MURPHY. We have had informal estimates.

Senator FERGUSON. Have we asked you to do that?

Mr. HAGLUND. I think it was brought up for discussion last year.

Senator FERGUSON. Cannot we ask you to tell us the difference between what you now pay and what you could get it done for on the outside? That is what the chairman asked of you.

Mr. HAGLUND. It wouldn't be a fair comparison right now, because the type of work they want to do is a little different from what we are having done, and they want escalator-type contracts which would permit them to adjust prices every 6 months.

Senator FERGUSON. Who, the outside people?

Mr. HAGLUND. The outside people.

Senator FERGUSON. Can't you get figures for the committee showing that?

Mr. HAGLUND. Yes; we could get some figures.

Senator FERGUSON. I tell you why I make this inquiry. My information is not very good information, but my information is that printing on the outside, outside the Government Printing Office, costs much less than when the same printing is done in the Government Printing Office. I got that from some sources.

Mr. CAWLEY. Mr. Chairman, may we supply that information to the committee and not on the record?

Senator MCCARRAN. Yes; surely. That is all right.

Senator FERGUSON. If you want to put it off the record, that is all right.

Mr. CAWLEY. I would like to speak off the record just a moment.

Senator MCCARRAN. Certainly. Off the record.

(Discussion off the record.)

Senator MCCARRAN. You are asking for an increase on this printing item; I take it that the "Other objects" is printing, principally.

Mr. MURPHY. That is right. It is principally that 5,000 extra patents that we think we are going to issue next year.

Senator MCCARRAN. You ask for $186,000 additional.

Mr. MURPHY. About $37 per patent.

INABILITY TO FILL VACANCIES RESULTED IN SAVINGS OF PART OF APPROPRIATION

Senator ELLENDER. Mr. Murphy, I noticed on page 762 of your justification by activities that in your 1951 estimate the positions that you had available were 1,287. You were granted sufficient funds by the Congress, presumably, to employ that many people, but you didn't so employ them; did you?

Mr. MURPHY. No. It was 1,287, and our average employment was 1,255 in 1951.

Senator ELLENDER. So in 1951 you utilized services of 32 persons less than you were authorized.

Mr. MURPHY. That is right.

Senator ELLENDER. I notice the same thing under "Legal counsel." You could employ 78, and you employed only 77.

Mr. MURPHY. That is right.

Senator ELLENDER. On "Personal service for trade-mark examining," you would employ 130, and you employed only 127.

Mr. MURPHY. That is right.

Senator ELLENDER. And so on down the line. What became of the money that wasn't used?

Mr. MURPHY. That we saved.

Senator ELLENDER. That goes back to the Treasury?

Mr. MURPHY. Yes; that goes back to the Treasury.

Senator ELLENDER. That is your saving that you spoke of a moment ago.

Mr. MURPHY. Yes, by our so-called lapses.

Senator ELLENDER. Not being able to employ others.

Mr. MURPHY. Not being able to fill vacancies.

Senator ELLENDER. I was a little confused a while ago, and I have it straight now.

Senator MCCARRAN. Are you budgeted by the quarter? In other words, do you get a certain amount per quarter?

Mr. HAGLUND. Yes, sir.

Senator MCCARRAN. In your answer to the Senator, you say that goes back to the Treasury. It really never came out of the Treasury.

Mr. MURPHY. That is right. We never used it, really; yes. We didn't juggle it around.

Senator ELLENDER. I should have said it remains in the Treasury.

Mr. MURPHY. That is right. We had no need for it.

Senator MCCARRAN. Is there anything else you want to tell us about?

Mr. MURPHY. I don't think so, Senator, if I have made the points clear that you have asked about.

Senator MCCARRAN. Do you feel you have convinced this committee all right?

Mr. MURPHY. I believe so, Senator, except on those fees. There seems to be some little doubt there.

Senator McCarran. That is a matter that is not a question that this committee will deal with excepting for our own inquiries for our own enlightenment. It is something that must be done legislatively.

Mr. Murphy. I hope we have convinced the committee as to our operations because we are proud of them in the last 18 months. It really is a great feeling to us to have all our divisions within less than 12 months. It used to be many times we would have inquiries, sometimes congressional inquiries, in which a constituent would write to a Senator, and the Senator would write to us and want to know when the application would be examined of one of his constituents, and we had to write the Senator and say "It will not be taken up for 2 years and 2 months," and we would have to say "Sometime in 1954." It is tough to have to tell a thing like that. Now we don't. We are within 12 months on everything.

Senator McCarran. If a Senator wrote to you and said he was trying to help out, couldn't you reach from the bottom and pull it out? [Laughter.]

Mr. Murphy. I suppose we could, but we probably wouldn't be around there very long. A lot of us hope to stay there for some time.

Senator McCarran. All right, thank you very much.

WEATHER BUREAU

STATEMENTS OF W. F. McDONALD, ASSISTANT CHIEF OF BUREAU; R. C. GRUBB, BUDGET OFFICER; R. R. HAMANN, ASSISTANT BUDGET OFFICER; W. A. STRIPLING, BUDGET EXAMINER; AND FRANCIS R. CAWLEY, BUDGET OFFICER, DEPARTMENT OF COMMERCE

SALARIES AND EXPENSES

Senator McCarran. The "Weather Bureau" is the next appropriation for consideration. Pages 1004 and 1005 of the justifications will be inserted in the record.

(The justifications referred to is as follows:)

Summary of requirements

Appropriation 1951 (regular bill)		$24,897,000
Deduct—		
1. Savings under sec. 1214	$125,000	
2. Rents and utilities assumed by General Services Administration	116,000	
		−241,000
Base for 1952		24,656,000

Net difference, 1952 over 1951:

By activity	Requirements		Difference, increase (+) or decrease (−)	
	1951 adjusted	1952 estimate		
1. General weather services	$22,622,379	$24,402,166	+$1,779,787	
2. Research	627,841	793,270	+165,429	
3. Administration	1,477,280	1,496,064	+18,784	
Gross requirements	24,727,500	26,691,500	+1,964,000	
Adjustments under appropriation: Reimbursements for services performed	−71,500	−71,500	0	
Adjusted requirements	24,656,000	26,620,000	+1,964,000	+1,964,000
Total estimate of appropriation, 1952				26,620,000

Summary of estimated obligations

	1950 actual (adjusted)			1951 estimate (adjusted)			1952 estimate		
	Positions	Average employment	Cost	Positions	Average employment	Cost	Positions	Average employment	Cost
Personal services:									
Permanent positions	4,526	4,379	$18,023,382	4,466	4,333	$18,663,994	4,558	4,417	$19,725,883
Part-time and temporary positions	2,224	198	356,875	2,219	197	355,500	2,253	223	389,500
Total personal services	6,750	4,577	18,380,257	6,685	4,530	19,019,494	6,811	4,640	20,115,383
Other objects			6,027,953			5,708,006			6,576,117
Total	6,750	4,577	24,408,210	6,685	4,530	24,727,500	6,811	4,640	26,691,500

Employment Nov. 30, 1950: 4,213 (does not include part-time employment).
The total annual salary rates of the 4,466 full-time positions in 1951 and the 4,558 positions in 1952 are $17,983,140 and $19,021,815, respectively.

AMOUNT REQUESTED

Senator McCarran. The budget estimate is in the amount of $26,620,000, an increase of $1,964,000 over the adjusted appropriation for the current fiscal year.

Senator Ferguson. It costs us money to know what the weather will be, does it not?

Senator McCarran. Will you proceed and see if you can justify that $1,964,000?

Senator Ferguson. I suppose that is because of the defense program? Did you see this cartoon? It has weather in it. That is why I am showing it to you.

Mr. McDonald. Senator, we will contribute to the defense program, but we are not here primarily or indeed at all because of the defense program. You will find the defense program referenced from time to time as a beneficiary of some of these items, but I can assure you that we are here and that our work is done from the point of of view of the interests of the civilian economy, although we do of course try to contribute to the defense program as we can.

Senator McCarran. 1951 you had $24,897,000, is that right?

Mr. McDonald. In 1951, $24,897,000.

Senator McCarran. You notice the parenthesis here, "regular bill." Did you get some other appropriation afterward?

Mr. McDonald. There was nothing else.

METEOROLOGICAL INSTALLATION IN ICELAND

Senator McCarran. I notice the Weather Bureau is requesting authority to transfer funds to the State Department for use as a contribution to the International Civil Aviation Organization for the United States share of the cost of meteorological installations in Iceland. Why should this appropriation be made to you? Why shouldn't it be made to the State Department directly?

Mr. McDonald. Are you speaking to this new language proposal?

Senator McCarran. Yes.

Mr. McDonald. The fact is that we are presently maintaining this Iceland station within the current appropriation, as a part of the Trans-Atlantic aviation support, both military and civil. It is done because of course the Icelandic Government has been incapable of supporting that kind of activity within its small means. Means are made available from the Weather Bureau appropriation to do that job. It is international in its bearing and in its importance so that it is properly the object of this recently established plan for joint support, meaning support by the several nations receiving benefits through the International Civil Aviation Organization which is in itself international in scope.

Senator McCarran. Will you clarify why you turn the money over to the State Department?

ACTIVITY OF STATE DEPARTMENT THROUGH INTERNATIONAL CIVIL AVIATION ORGANIZATION

Mr. McDonald. Because we now receive the money and if this activity is taken over under joint support we would expect properly and normally to release the money which we now spend on that pro-

gram in the interest of the national support. We wouldn't attempt to hold that money in the Weather Bureau appropriation but would release it to the National Treasury to be put to use through State, which handles this joint support program.

Senator McCARRAN. In other words, you turn it over to the State Department to be a distributing agent for all of the funds that come from the other countries as well as from this country?

Mr. McDONALD. No. State handles the funds from this country into this pool, and negotiates it.

Senator McCARRAN. Where is the pool?

Mr. McDONALD. Under ICAO, the International Civil Aviation Organization, which has become the agency to handle the pooled funds. Iceland then would operate under this agreement with joint support.

Senator FERGUSON. Then that ought to save us money.

Mr. McDONALD. To some extent perhaps it will.

DISCUSSION ON COST OF OPERATION OF ICELANDIC STATION

Senator FERGUSON. You always get this "perhaps." If they take it over and we are operating it today, why would it not save us money? It is going to be operated under a joint fund in the future.

Mr. McDONALD. That is correct. Iceland already operates some meteorological service, but for other purposes.

Senator FERGUSON. For their own boats, fishing and so forth.

Mr. McDONALD. That is correct. This language is not fixed as to amount. It is language authorizing the adjustment in appropriation necessary to make the joint support available. We can tell you today what we spend on it.

Senator ELLENDER. You pay the entire cost now, do you not?

Mr. McDONALD. Yes; but the measure of what the United States Government would put in, we wouldn't fix.

Senator FERGUSON. You can't put more than 100 percent.

Mr. McDONALD. Of course not, and you may be correct that when this is worked out by State, the United States Government may put in less. We would, nevertheless, be called on to reduce our appropriation by the amount we now spend.

Senator ELLENDER. Are you asking now for as much as you asked last year when our Government operated the whole outfit?

Mr. McDONALD. Yes; because we still are operating the station. This language will permit a reduction in our appropriation by whatever amount is decided upon as the amount to draw upon.

Senator ELLENDER. But you are asking for the full appropriation.

Mr. McDONALD. Yes; because we still operate the station.

Senator FERGUSON. When will it be taken over?

Mr. McDONALD. I can't tell you exactly.

Senator McCARRAN. They are asking for the full appropriation with the idea that they will turn this over to the State Department at some later date, but it is turned over then to this organization in the United Nations?

Mr. McDONALD. Yes.

Senator McCARRAN. You have been maintaining it entirely up to the present time.

Mr. McDONALD. That is right.

Senator McCarran. So far as you know, you may turn this whole amount over to the State Department to operate it entirely.

Mr. McDonald. I think the best clarification I could make of that would be to explain that what is decided upon in the nature of the adjustment doesn't initiate with us. We understand that we will probably be called on to release all that we spend on this station. The Budget Bureau will act as the clearinghouse to determine how much we are deducted in our appropriation, and later how much properly goes to State in terms of this joint support program.

Senator Ferguson. The first thing we know, we will be paying more money to operate this United Nations service. That is the way it looks to me. I am going to watch this one and see what happens. I can't understand why it costs more to operate it with a share paid by the United Nations than it does to operate it alone.

Mr. McDonald. Mr. Senator, if I might make a point, I am unable to tell you that it will cost more.

Senator Ferguson. But you are not very optimistic that it will cost less because you are putting it all in here.

Mr. McDonald. We name no amount in this. This is permissive language, which means that we will be subject to a draw down in our appropriation.

PRESENT COST OF OPERATION OF STATION

Senator Ferguson. What is the station costing you now?

Mr. McDonald. $160,000 per annum.

Senator McCarran. I have before me the State Department's justification here, and this shows they are asking for Iceland $50,400, and for communications, air traffic control, and meteorological services, $255,000. I just draw that to the attention of the committee so that we may remember it when the State Department comes before us.

Senator Ferguson. Today we are operating it all, totally, for the $160,000?

Mr. McDonald. I am not certain that is the whole cost because I notice the phraseology says traffic control and communications, so there probably is some draw down of CAA appropriation in this matter too. I am not able to tell you whether there is or not, but it sounds as if there may be a combination of contributions here, part of it meteorological and part of it from Civil Aeronautics.

Senator Ellender. I notice here that we are to be taxed 70 percent of the cost, according to the State Department's figure.

Mr. McDonald. I couldn't speak to that point at all. It is outside the range of our own planning and programing.

Senator McCarran. You are asking for an appropriation now. You are asking for language that will permit you to dispose of the money over to the State Department.

Mr. McDonald. That is correct. This language in effect is asking for permission to reduce our appropriation.

Senator McCarran. That is to reduce it by turning it over to the State Department.

Mr. McDonald. Yes.

Senator McCarran. And the State Department will turn it over to the United Nations.

Mr. McDonald. That is right.

Senator ELLENDER. How much are you asking?

Mr. MCDONALD. The language is simply permissive. In our base appropriation we continue to ask for the $160,000 which it now costs yearly to operate this station. That is a part of our basic operation until this arrangement is worked out.

Senator MCCARRAN. It doesn't reduce your request for appropriation.

Mr. MCDONALD. No, of course not, because we don't know when this change-over will come to pass.

Senator ELLENDER. Senator McCarran, from the data from the State Department, that you referred to a moment ago, it must be for something else, because in that it says Iceland 70 percent or equal to $50,400. That must be something else.

Senator MCCARRAN. We will find out.

Senator FERGUSON. It is something else. Do you not think that your service up there now is sufficient?

Mr. MCDONALD. I believe it is.

Senator FERGUSON. They have never objected to it.

Mr. MCDONALD. We are not particularly anxious to continue this station.

Senator MCCARRAN. While we are on this subject I would like to ask the budget officer to submit a statement for the record on all this, a breakdown of all of it, if you please.

Mr. STRIPLING. Involving CAA and the Weather Bureau. Yes, we shall be glad to.

(The information requested is as follows:)

STATEMENT REGARDING KEFLAVIK, ICELAND

The only funds for Keflavik included in the budget presented by the Department of Commerce are those contained in the estimates for the Weather Bureau. The present annual rate of expenditures for the operation of the meteolorogical services at Keflavik, Iceland, by the Weather Bureau is approximately $160,000. Operations of the control tower and communication facilities at Keflavik are performed by the Lockheed Aircraft Corp. under contract between that corporation and the United States Air Force.

Senator MCCARRAN. I interrupted you when we brought up this matter. Do you have a statement you wish to make in justification?

Mr. MCDONALD. I believe it might be worth while to repeat here the statement which Dr. Reichelderfer himself prepared.

Senator MCCARRAN. You can highlight it, if you want to.

Mr. MCDONALD. Suppose I file this for the record.

Senator MCCARRAN. That is all right.

Mr. MCDONALD. It is his own statement and I would like it to appear in the record.

(The prepared statement is as follows:)

STATEMENT BY DR. F. W. REICHELDERFER, CHIEF, WEATHER BUREAU

In the present emergency the Federal Government is expected to economize and improve its efficiency. Field service surveys show that the Weather Bureau has accomplished much in this direction. For example, despite increasing demands for meteorological services for aviation, agriculture, and so on and despite severe criticisms because the waiting line for pilots who need flight weather information often causes delay, the Weather Bureau has reduced the number of its stations, curtailed its personnel and materially reduced the percentage of its expenditures for administration during the last 2 years. At the same time, the Bureau's services must contribute much to national productiveness in foodstuffs and

to operating efficiency in industry, transportation, and other major branches of the national economy. In emergency, advance knowledge of weather and climate is, more than ever, vital to efficiency and economy in national life. Destructive hurricanes, devastating cold waves, and other meteorological disturbances can be much more destructive if they come unexpectedly. Safety of life and protection of crops and livestock call for the best possible meteorological coverage by the national weather service carried on by the Weather Bureau.

The monetary value of modern weather service is well established and may be illustrated by specific examples: (1) Fruit-frost service furnished the citrus fruit industry at a cost of $326,000 per annum saves growers many millions per year—on occasion as much as $20,000,000 on a single freeze. (2) Flood warnings result in average annual savings that exceed $30,000,000. (3) Guidance to motorists regarding the use of antifreeze is estimated to be worth $50,000,000 per year. Warnings in this connection are particularly valuable in those areas of the South where permanent freeze protection is seldom practiced.

The phenomenal development of the aviation industry has made necessary a parallel intensification in weather reporting and weather forecasting services. The weather service not only guides the planning of flight operations prior to take-off, but reaches aircraft in the air and in many cases gives information on hazards that are avoided by selection of different flight levels or alternate landing fields.

All told, actual savings attributable to weather service exceed the total of the Weather Bureau appropriations by more than fiftyfold. Beyond these estimated values is a general public benefit that is beyond computation; it is impossible to estimate the value to be placed on information that saves life, and protects property over and over again.

Apart from any dollar value attached to it, weather services make a very large contribution to national efficiency. New benefits not fully realized may far exceed those now being attained. As a single example, it is estimated the annual value of the cotton crop could be increased by at least $400,000,000 if insect and defoliation spraying operations could be solely scheduled during weather conditions that will assure maximum effectiveness. However, appropriations to the Weather Bureau for the past 2 years have not been sufficient to support the increased costs of going programs. As a result employment was reduced by approximately 300 positions between September 1948 and July 1950, in the face of increasingly urgent requirements for service.

The budget for 1952 includes $1,000,000 to finance new international commitments and $964,000 for additional domestic requirements.

International commitments include:

(*a*) Establishment of a main meteorological office at Guam ($105,000) and weather service in the trust territory immediately south and east of Guam ($250,000).

(*b*) Increasing the number of upper-air soundings at 8⅓ ocean stations from two to four per day to comply with ICAO commitments and international practice and thereby increase ocean coverage to nearly the same extent as doubling the number of stations ($320,000).

(*c*) Maintenance of outpost stations in the far north in cooperation with Canada. This program consists of two items: (1) As recommended by the Permanent Joint Board on Defense (United States-Canada), the Weather Bureau to furnish radiosonde supplies for certain upper-air stations in Canada that were originally established at the request and with the financial support of the United States during World War II ($150,000). (2) Establishment of a small meteorological station in the high Arctic at Melville Island in cooperation with Canada completes the United States share of the presently planned cooperative Arctic network. In addition it will be necessary to replace and augment heavy equipment now in use at existing stations. Some tractors, cargo sleds, generators, fork lifts, etc., have been in use over 5 years and must be replaced to assure survival of Arctic stations now operating ($175,000).

Additional domestic requirements are as follows:

(*a*) Fire-weather forecast service ($50,000): Funds have not been available to provide this service on a Nation-wide basis. Important timber-producing States not now receiving service include Florida, Georgia, Alabama, Mississippi, Louisiana, Arkansas, Missouri, and the forested portions of Texas and Oklahoma. An average of 140,000 forest fires occur in these States annually, destroying 2 billion board feet of timber and denuding 24 million acres of land. Experience has shown fire-weather service will reduce losses at least 5 percent wherever it is possible to organize adequate service. Hence, it is proposed to assign fire-

weather specialists to a few of the most critical locations to work with State and Federal forest officials.

(*b*) Facsimile transmission of weather charts ($30,000): This pilot project would provide for installation of drops from the Air Force facsimile network at eight field station. By this means it will be possible to transmit analyzed charts prepared centrally for use in forecasting. The charts cannot be prepared within limits of available staff at field stations.

(*c*) Full-time Weather Bureau offices ($60,000): Funds are requested to open stations at Orchard Place, Ill., and Teterboro, N. J. The capacity of these two air-traffic centers to receive and discharge traffic has a wide effect on the national flow. Since these stations are integral parts of the Chicago-New York air-traffic complex, aircraft operators must be constantly advised of current and expected weather conditions at these key airports in order to keep traffic in mesh over the country and avoid unnecessary operating losses.

(*d*) Northern Hemisphere charts ($124,000): Progress in weather forecasting comes primarily through better understanding of hemisphere and global circulation of the atmosphere. Hence it is necessary to study circulation patterns covering a long period of time. The only means by which this can be done is to prepare daily weather maps of the Northern Hemisphere and it is the object of this project to carry forward in unbroken sequence this series of maps starting with January 1899. These maps are essential not only for peacetime research but also must be ready in event of war since they are an indispensable aid in planning military strategy for remote parts of the world.

(*e*) Pay adjustments ($700,000): The amount requested is made up of $194,000 for within-grade salary advancement, $71,000 for regular pay in excess of 52-week base, $150,000 for annualizing reclassifications accomplished in fiscal year 1951, and $285,000 to reclassify Weather Bureau positions in compliance with specifications published by the Civil Service Commission in August 1950. Under the Classification Act of 1949 it is mandatory to classify positions according to the findings of the Civil Service Commission, and since the Weather Bureau does not have funds to pay for the increased salaries, funds therefor are requested. Through our testimony in previous years we believe Congress is familiar with the conservative practices of the Weather Bureau as regards personnel staffing and grade levels.

Mr. McDONALD. Then, if you please, I would like to take up item-by-item some discussion of these items of new program which are represented here over and above our going concern on the current basis of operations.

Senator McCARRAN. Under the head of summary of requirements on page 1004, which is now in the record, let's take that right down. You have an item here which says "savings under section 1214." I take it that is impounded money.

Mr. McDONALD. That is correct, that is the impounded money.

Senator McCARRAN "Rents and utilities assumed by General Services Administration, $116,000." That was rentals and utilities that you were paying out?

Mr. McDONALD. Which they will hereafter pay.

Senator McCARRAN. General Services will pay that from now on.

REASON FOR REQUEST FOR INCREASE IN APPROPRIATION

The base for 1952, you state, net difference, 1952 over 1951. Will you explain what is before you there, the requirements and the differences. General weather services is the first item under requirements. In 1951, you had $22,622,379. In 1952 you are asking for $24,402,166, for an increase of $1,779,787. Will you give us an explanation as to why that is?

Turning to page 1008, please go into that and explain it.

Mr. McDONALD. I will try to do that. The first section, as the justification indicates, comprises five separate items of increase, and

as a general introduction to these items I might say that they are put together here as international commitments, meaning of course, that in many respects we are going along with the national interest and commitments made not primarily by ourselves, but by the Nation, and in a manner which calls upon the Weather Bureau to come along with some of the supporting activities.

METEOROLOGICAL STATION AT GUAM

Senator McCarran. Will you take these item by item. First, the main meteorological office at Guam. When was that entered into, what percentage of it are we to maintain, and so forth? Give us a full detailed statement on that, and on each one of these items.

Senator Ferguson. Then, Mr. Chairman, could he tell us before it was listed under "International commitments" how much it cost to operate that service as an American service?

Mr. McDonald. As to Guam we maintain no service at all, although it is an important crossroads point on the trans-Pacific air route and will become increasingly important in this trust territory arrangement whereby the United States will take over the management of that tremendously large island area in the Pacific. Guam will be a key base for that whole trust territory activity. At present there is meteorological service in Guam, of course, but it is maintained wholly by the military. They are reluctant to assume for the future and in terms of the civilian requirements the continued meteorological service for civil operations. They feel that they should specialize their work. Defense airports are commonly reserved for military traffic, and those conditions, you can understand, might very well give them good grounds to represent the desirability of the civil weather service assuming this international obligation. Moreover, it was thoroughly discussed in international meetings in the Pacific under the ICAO Convention. These were general preparatory and planning meetings which advanced the civil aviation interests as a whole. Guam was then identified as the main forecasting office for trans-Pacific flight operations, at which point in United States territory the United States under that convention would render the same service as other nations do for us in their own territory. That would require that we establish an adequate overocean forecasting office in Guam, and this sum is in effect the requirement for such an office.

SUPPLIES AND MATERIALS

Senator Ellender. I notice you have "Other objects," $44,730. Is that supplies?

Mr. McDonald. Supplies and materials are the largest single item in that.

Senator Ellender. Aren't you going to use the Navy's facilities there or the Army's, whoever is handling it?

Mr. Grubb. The equipment will be used, Senator. Equipment is now furnished by the Navy, but we will require funds for expendable supplies used for upper-air observations. I will be glad to go into details of the breakdown of the other objects, if you would care to have them.

Senator ELLENDER. I was interested particularly in Guam since you said that the Navy is operating the station there. Do you know what it costs the Navy to operate it?

Mr. GRUBB. No, sir.

Senator FERGUSON. Will they operate it in the future after we put in money for its operation? They probably will?

Mr. MCDONALD. They will operate a naval activity.

Senator FERGUSON. And so will the Army?

Mr. MCDONALD. Perhaps so.

In brief, the explanation of this comes out in these terms: An average of 10 employees for a salary roll of $60,270 per annum, and then the remainder of $44,730 is the requirement for all other objects, including a rather costly requirement for the upper-air expendables.

Senator FERGUSON. Why shouldn't we make arrangements to use the Army and Navy service there? They are just as much interested in this question as anyone could be because of their own place. We use that for civilian weather information?

Mr. MCDONALD. That is the way it is operating now, Senator.

Senator FERGUSON. Why shouldn't we continue it? Why should we allow a change?

CIVILIAN VERSUS MILITARY OPERATION

Mr. MCDONALD. I would say that in principle I believe this to be true: A civil operation is a more economical operation. The civil interest is not, by and large, fully and adequately served by military meteorological installations. They are specialized in a way which doesn't adequately serve civil interests.

Senator FERGUSON. I can't understand that. They are just as interested in their flights as any civil operation.

Mr. MCDONALD. May I go off the record a moment and make some remarks?

Senator MCCARRAN. Yes.

(Discussion off the record.)

EXPLANATION OF TRUST TERRITORY

Senator MCCARRAN. What do you mean by "Weather observations in trust territory"? We have had handed to us by Mr. Cawley a graph showing what is evidently designated trust territory, islands of Pacific, between Japan and Borneo and New Guinea. Is it your plan to set up stations on each of those islands?

Mr. MCDONALD. No, sir. This plan contemplates only in part to continue what is now being maintained actively as military installations. The Navy itself is now maintaining 4 upper-air stations in these islands, with these making 8 to 16 observations daily, supplemented by weather reconnaissance by airplane from Guam. The Weather Bureau proposal contemplates the installation of only two such stations with only two observations daily. That is the measure of the amount of reduction in activity which actually would take place if we are given this kind of appropriation to move in behind what is now being done under military appropriations. It is a very much smaller program, as a matter of fact, than is now being carried on.

I might say that we regret that to some extent, because we regard this as the absolute minimum, and it is hardly adequate. It ought to be a larger program. But this was the amount which was incorporated in the President's budget after careful review, and we will hold this territory together meteorolgically with some such amount of appropriation. We will do the job, but it will not be a very big job. That is an extremely large area, and I would say it is an important area because the typhoons that affect Guam, Okinawa, and our islands out in that area and also affect greatly the Philippines where we have tremendous interests, originate in these island areas, and they can move in almost any direction over the geographic scope of the trust territory. This we believe to be a very conservative program for such a large area.

By the way, I might say that in part and as far as possible the work will be done by training natives of the islands to participate in the actual operating program.

Senator McCarran. This is the group of islands that has passed over to civil control, of which Senator Thomas of Utah is Governor?

Mr. McDonald. That is correct. The territory is actually under the guidance now of the Department of the Interior, as the civil agency for administering the trust. It is proper and I think wholly justifiable that another civil agency go in behind the military. The military has withdrawn and the civil agencies must take over that area.

IMPROVEMENTS IN UPPER-AIR COVERAGE

Senator McCarran. I am looking at "Improvements in upper-air coverage over Atlantic and Pacific Oceans." What improvements in upper-aid coverage?

Mr. McDonald. Mr. Chairman, as you know, we operate and have for some 10 years been operating upper-air sounding programs over the oceans on Coast Guard ships as platforms for our work. Our own participation is limited to providing the personnel and materials for these observations.

Senator McCarran. How many of those have you? How many ships?

Mr. McDonald. May I speak about locations rather than ships? It is a little bit clearer. The effort is to provide these observations at predetermined locations, with a ship going out on station for a month and then being replaced. So there is a succession and rotation in ships. It takes about three times as many ships as stations to do the job. There are 8⅔ stations, because one station is already being maintained as a joint international job. The whole plan has a great deal of international flavor and it is for that reason that it is in this general bracket of international commitments. Other nations are operating similarly.

PARTICIPATING NATIONS

Senator McCarran. Are the other nations paying any of the costs of these ships?

Mr. McDonald. They are maintaining their own stations by their own ships; that is right.

Senator McCarran. Do they exchange information with you?

Mr. McDonald. Yes, fully; that is correct.

Senator McCarran. You have complete cooperation in that respect?

Mr. McDonald. Very complete, and I would say very profitable.

Senator McCarran. What nations are maintaining those?

Mr. McDonald. Britain, Norway, the Netherlands, France, and Canada are participating nations.

DISCUSSION REGARDING POSSIBLE RUSSIAN STATIONS AND SECURING OF INFORMATION

Senator McCarran. The Russians are also maintaining some stations, are they not?

Mr. McDonald. Not so far as I know, in either the Pacific or the Atlantic. Perhaps in the Arctic; yes.

Senator McCarran. In the Arctic.

Mr. McDonald. Probably so.

Senator Ellender. Why should they? They can get it from us, can they not? It is published every day.

Senator McCarran. Can they get that information from us?

Mr. McDonald. It happens that the weather moves over the Pacific to us and is past Russia before we begin to check on it.

Senator McCarran. What is that?

Mr. McDonald. The weather has passed Russia, by and large, before we begin to check it in the Pacific, and when we check it in the Pacific it is very much for our own benefit because the weather is moving this way—moving eastward rather than westward.

Senator Ellender. Is that because of the prevailing winds?

Mr. McDonald. The prevailing procession of weather is from west to east. So when we check in the Pacific we are checking mostly for our own benefit. The Russians would get very little out of it.

Senator Ellender. But they could have access to it.

Mr. McDonald. They do have. As a matter of fact, we are getting reports out of Russia. It seems to be about the last area in which there is a fair working cooperation—the weather area. As a matter of fact, I might tell the committee that the Russians are represented at Paris now in this international meeting which the Chief of the Bureau is attending and where I might say for your information he had the honor to receive the signal notice of being elected president of this World Meteorological Organization, with the Russian bloc fully represented in those meetings. I believe we will continue with a cooperative arrangement. So we are participating in this international area and are getting a great deal of benefit from the meteorological work which the Russians themselves do. We are copying their work, and naturally they are copying ours. I would like to go off the record.

Senator McCarran. Off the record.

(Discussion off the record.)

Senator McCarran. What is the list of supplies that you are going to send to Canada?

Mr. McDonald. I would like to go back to say that this international arrangement for ocean weather contemplated four soundings a day from these ships. The platforms cost a great deal to operate. The other nations are for the most part taking four upper-air soundings from their ships. That was the original plan. We are taking

only two. These ships are so widely spaced and these stations cost so much to operate in the way of Coast Guard operation that we feel we are not getting value received unless we go up to four a day, too. By taking more frequent observations we get the effect of multiplying our stations because we are sectioning this stream of weather more frequently and thereby are better able to fill the gaps which exist in this coverage—and there are very, very side gaps.

So the importance of this plan, as it is worded here, for "improving our observations" is to go from two to four operations per day and get more dividends on the already costly program that is going on.

Mr. Chairman, I may have neglected your particular question.

SUPPLIES FURNISHED TO CANADA

Senator McCARRAN. These supplies that you are furnishing to Canada, the fourth item under "International commitments." What are they?

Mr. McDONALD. These are again upper-air observational supplies, expendables, rather costly supplies that are released, and when they are released they are lost, for the most part.

Senator McCARRAN. Are they balloons?

Mr. McDONALD. They are actually rawinsonde instruments, not the balloons. Canada has no way of manufacturing them, and we do have. Our production is good and quite economical. This is in effect our contribution to the joint enterprise in Canada, of which we are the large beneficiary. This program goes back some years, and the whole United States-Canadian Arctic program is a part of the recognition of this area as being meteorologically of great importance to us. We are operating jointly with Canada certain stations in the high Arctic under special legislation. Then the intervening area is an area in which we have mutual interests and where we feel it is appropriate to assist Canada to maintain a proper net of observations.

PAYMENT BY CANADA IN MAINTAINING JOINT OPERATIONS

Senator ELLENDER. What proportion of the expense of maintaining joint operations is Canada paying?

Mr. McDONALD. It is 50–50 as to personnel. Pardon me, may I correct that? Are you talking about the high Arctic stations?

Senator ELLENDER. That is what I am talking about.

Mr. McDONALD. We share about 50–50 in terms of personnel for high Arctic stations, the ones that are jointly operated, although we furnish all the expendable upper air sounding supplies for the high Arctic service. We do not share personnel at all on the intermediate stations; Canada provides for them.

Senator ELLENDER. Except the supplies.

Mr. McDONALD. We are helping them by a contribution of supplies for the upper air program.

AMOUNT REQUESTED FOR ARCTIC PROGRAM

Senator McCARRAN. The Arctic program. You want a total of $175,000?

Mr. McDONALD. Yes, sir.

Senator McCarran. What does that cover in the way of study and research?

Mr. McDonald. This covers two main elements of expenses.

Senator McCarran. This is an international commitment again.

Mr. McDonald. Yes; it is still an international commitment because this relates to the stations of which I have just been speaking, the high Arctic stations jointly operated by Canada and the United States.

One additional point is needed in that net, one additional station, and this includes in part the cost of putting in a rather modest station intermediate to some of the other widely spaced spots and useful because of the necessity for airlift to supply these stations. We need an intermediate station to protect the airlift, which is the sole way of reaching the outposts.

The other portion and perhaps the most important part of this estimate is for the replacement of heavy equipment, tractors and earth-moving equipment and snow-moving equipment. These are absolutely requisite to the safety of airlift operations because we must maintain airstrips at these stations in order to have the transport for personnel, supplies, and whatever is needed.

The military of course provides that airlift. The Canadian military and the United States military share that task, and they have come to the place where they have learned by some rather bitter experience the hazards of operating without snow removal. I mean just preceding each airlift operation there must be a clearance of the airstrip. The basic strip must also be kept in order. This means that heavy equipment must be maintained in operating condition not only for the safety of lift in support of the men who are isolated there for a year at a time, but for the safety of these air crews who supply the stations. It is an extremely important matter that we be in position to replace obsolescent and worn-out equipment.

VALUE OF EQUIPMENT IN THE ARCTIC

We have an estimate that the whole capital value of this equipment in the Arctic is roughly $1 million; $924,000, to be exact, is our total capital value of the equipment that is up there.

Senator McCarran. Which is there now.

Mr. McDonald. Yes sir. The life of that equipment is not much better than 5 years. We ought to have an obsolescence factor in these estimates of about $200,000 a year. Actually we are asking for only $141,000 for the whole item.

Senator McCarran. I don't see why you put this under the head of international commitments. We are maintaining those alone by ourselves.

Mr. McDonald. No, Mr. Chairman, may I correct you. Canada participates jointly with us in these stations.

Senator Ellender. Even as to the equipment to clear the airstrips.

Mr. McDonald. No; we are furnishing most of the equipment.

Senator Ellender. When you say that Canada furnishes 50–50, you mean as to personnel?

Mr. McDonald. As to personnel.

Senator Ellender. But we furnish all the equipment, all the supplies.

Mr. McDONALD. Mostly. I believe they furnish all permanent housing. I am advised that we furnish about 75 percent of the other objects under the terms of our undertaking.

PERCENTAGE OF COST PAID BY UNITED STATES IN ARCTIC OPERATION

Senator ELLENDER. The actual cost of operation in dollars and cents would be what percentage?

Mr. McDONALD. I would have to give you a rough figure on that, probably two-thirds.

Senator ELLENDER. Ninety percent?

Mr. McDONALD. No, 75 percent at the most.

Senator McCARRAN. Go ahead.

Mr. McDONALD. May I speak a little further to that?

Senator McCARRAN. Yes.

Mr. McDONALD. This whole program of high Arctic stations was a United States proposal. The strategic importance of weather information alone is tremendous. That bypasses for the moment the importance to the civilian economy. Perhaps we had better go off the record.

(Discussion off the record.)

FIRE-WEATHER FORECAST AND WARNING SERVICE FOR SOUTHERN STATES

Senator McCARRAN. We go now into domestic requirements. Fire-weather forecast and warning service, for which you want $50,000. I think they would know pretty well what you mean by that.

Mr. McDONALD. This is to get into the Southern States with a service that has proved its value abundantly over a long term of years in the other major forest areas of the Nation, in the West and in the North. This is to go into the South for a similar assistance to the forest interests. I think I can do no better job of high-lighting this than to say that in these six States in which the program is contemplated—Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas—the Forest Service estimate of annual fire damage approaches $30 million a year, just fire damage alone. They credit the fire-weather warning service where it has been operated as we know how to operate it, with potential reduction of 10 to 15 percent in fire loss. So on the basis of the known damage we could expect this investment to pay to the South something like $3.5 million a year in savings which are now going up in smoke in their forest areas.

Senator ELLENDER. How much expense does that entail, Mr. McDonald?

Mr. McDONALD. This $50,000 is all we are asking.

Senator ELLENDER. For the entire area?

Mr. McDONALD. Although I want the fact made clear that this is not to do the job as we would like to do it. This is to get a good beginning of it. The whole job should cost about $150,000, and cover some additional southern territory.

MODE OF OPERATION

Senator ELLENDER. What do you do?

Mr. McDONALD. We will institute specialized services, put specialists in fire-weather warning service at key points in close relation-

ship with the forest interests, National, State, and private. Tentatively, we plan to take Shreveport, Meridian, and Tallahassee as points at which to institute a fire-weather-watch operation, with full-time specialized people, who will be in touch with the forest people themselves, know what is at stake, know what the current condition is, and by close coordination help them so dispose their fire-protection measures as to gain this 10 or 15 percent of avoidable loss which they tell us the fire-weather service is capable of giving.

Senator ELLENDER. Is that information that you give them with respect to the oncoming weather?

Mr. MCDONALD. Yes, sir.

Senator ELLENDER. Conditions that they may expect in a certain period?

Mr. MCDONALD. Yes; conditions which make for greater hazard from fire in one spell of weather or another, so that they can prearrange their fire-fighting dispositions.

Senator ELLENDER. Why couldn't that information be dispensed by your stations that are there now?

Mr. MCDONALD. In the first place, they are not specialists in the fire-weather interest, and it does require some specialization and study with forest people of what is at stake in this matter. It also requires special watch. Secondly, no one of these stations now has enough freedom, enough latitude within the demands already being met, to take on this additional job.

COST OF SIMILAR SERVICE IN OTHER PARTS OF COUNTRY

Senator ELLENDER. You mentined that a similar service had been instituted in other parts of the country.

Mr. MCDONALD. It has been operating for years.

Senator ELLENDER. What does that particular service cost per year; do you know?

Mr. MCDONALD. In the remainder of the country we spend—I think the budget officer will have that figure readily available. My recollection is that it is about a quarter of a million dollars.

Mr. GRUBB. In 1951 we estimate the cost to be $158,000 in round figures.

PRODUCTION OF FORESTS IN SOUTH, MOST RAPID IN COUNTRY

Senator ELLENDER. That is the same kind of service that you propose to give the Southeast area?

Mr. MCDONALD. Yes; where now we have no service of that kind. As another footnote on this, the rate of forest reproduction in the South is the most rapid in the country, and fire losses in young growth are especially serious.

FACSIMILE TRANSMISSION OF WEATHER CHARTS

Senator MCCARRAN. The next item, "Facsimile transmission of weather charts." You are asking a total of $30,000 for that.

Mr. MCDONALD. Yes, Mr. Chairman.

Senator MCCARRAN. That is an increase; is it not?

Mr. MCDONALD. No; that is a new item of increase in our appropriation, a new program.

Senator McCARRAN. This fire-weather forecast and weather warning service is a new item, too.

Mr. McDONALD. The latter is an increase, but not a new program; it is an increase item for a new area.

Senator McCARRAN. It is a new service to that particular region.

PROPOSED METHOD OF TRANSMISSION

Mr. McDONALD. That is correct. It is an expansion of an existing service to a new area.

The facsimile transmission of weather charts is a brand-new item, but again it is an expansion of something on which we have experience. We are now benefiting by a system of transmitting weather charts and information over wire circuits—facsimile transmission—maintained by the military. The Weather Bureau, the Air Force, and the Navy together maintain a coordinated center for weather analysis and prognosis right here in Washington at the Weather Bureau central office, and out of that center flows a succession of prepared charts that are transmitted by the military to their installations over these facsimile circuits.

What we propose to do is to rent some machines to be attached to the existing circuit so that we may have the benefit of these transmissions that we have originated in our central office. Certain selected offices can thus improve the weather service without adding personnel. We believe this is an economical approach to the question of improving weather service with existing materials already bought and paid for. It is a fairly modest approach to it.

Senator McCARRAN. What is this for?

Mr. McDONALD. To rent machines actually to put in our office which will take this facsimile transmission off for the benefit of our service.

Senator McCARRAN. That in turn will be distributed?

Mr. McDONALD. It will be distributed in the form of forecasting services and weather services rendered by the Bureau. It will improve the weather service that we will be able to render.

Senator McCARRAN. For that you are asking $30,000?

Mr. McDONALD. That is correct. That would install machines in eight offices.

Senator McCARRAN. Those are leased machines?

Mr. McDONALD. Leased machines.

Senator McCARRAN. Two full-time Weather Bureau offices. Where are they to go?

Mr. McDONALD. They are to be located at the clogged up metropolitan air traffic centers, Chicago and New York, to supplement existing services and help to move this clogged traffic at better rates. One would be put in at Orchard Place, Chicago, the other at Teterboro, N. J., to supplement the service now provided at other airports.

Senator McCARRAN. That word "clogged" is comprehensive to me, but this record has to be read by others. Just what do you mean by that? Go into it a little bit.

Mr. McDONALD. The condition which leads us to select these two places for additional services is represented as of this character: Traffic in bad weather is now being delayed and at times backed up in terms of delay many hundreds of miles away from Chicago and New

York because the rate of acceptance for landings in Chicago and New York is slowed down by an inadequate ability to bring the traffic in through bad weather.

Senator McCarran. Inadequate ability to get the information out?

Mr. McDonald. It is partly that, but we need more information at these supplemental ports which will be used to relieve the overload. We now have no such adequate information for landings in these satellite ports.

Senator McCarran. Do you think that Chicago and New York are the two principal places where it should apply?

Mr. McDonald. Traffic studies show that they are actually the main air centers and the places at which this bottleneck condition most readily occurrs, to interfere with traffic schedules.

Senator McCarran. Los Angeles doesn't present such a picture?

Mr. McDonald. Not so much.

REQUEST FOR PAY ADJUSTMENTS

Senator McCarran. "Pay adjustments." I guess we understand what that is.

Mr. McDonald. I would like to make it clear that a large part of this is to meet classification standards published in August of 1950 applying to a considerable number of our meteorologists, particularly forecasters. These new standards of classification will require reallocations on a rather widespread scale, reallocations which under the law we are expected to meet and for which we will require an additional appropriation. Otherwise we will have to reduce service to meet the requirements of the law. We think it would be a very bad thing for the country to reduce our service in order to meet these legal standards of pay and classification. This is a thoroughly justifiable item of increase.

Senator McCarran. Is there anything else you want to say?

NORTHERN HEMISPHERE CHARTS

Mr. McDonald. Yes. There is one research item for the resumption and continued production of the so-called Northern Hemisphere charts, a very important research activity. I would like to show you a sample of that. These charts cover the whole Northern Hemisphere, one being produced for each day. It constitutes a historical sequence of weather over half of the world's surface. I would like to point out to you that these charts include fairly adequate coverage in the Siberian and Russian areas. They are analyzed carefully with all of the full collections of data, not only spot checks by telegraph, but supplemented by mail collections, so as to make the most accurate possible analytical picture of weather conditions for that day and time over the whole of half of the world's surface. This is perhaps the most important basic tool for weather forecasting research that we have in the world. This series was begun during the last war and was put together covering quite some period of years, and all research meteorology now asks that we continue to add to this sequence of charts and keep the series in effect as a continuing publication. We are rather far behind with it, and should another war

crisis overtake us, these charts will again become highly important documents in the national interest.

Senator McCARRAN. Do you call this a new project?

Mr. McDONALD. No. Again it is only to speed up and bring up to date a project that has had standing heretofore, but which is backlogging awfully badly at the present time for inability to produce these and keep up with the accumulation of the material.

PERSONNEL REQUIRED

Senator McCARRAN. How many additional personnel are you asking for that?

Mr. McDONALD. Mr. Grubb, I think, will give that.

Mr. GRUBB. Twenty-three.

Senator McCARRAN. What have you now?

Mr. McDONALD. Something like that number. I would like to supply that for the record, but I believe it is some similar number that we have now, perhaps a few less than that.

Senator McCARRAN. In research you have about 118.

Mr. McDONALD. The budget officer indicates that it is his recollection that we now have somewhere in the neighborhood of 8 or 10 on our rolls for these charts. There is some participation by military personnel in this. I believe we are now sustaining on our rolls only 8 or 10.

Senator McCARRAN. You want 23.

Mr. McDONALD. We want 23 additional to bring this program into gear with the requirement.

Senator McCARRAN. What do you mean by "other objects"?

Mr. McDONALD. The budget officer will explain that.

Mr. GRUBB. In the distribution of the other objects, Mr. Chairman, the principal items are: $13,000 for rents and utilities, principally for IBM equipment necessary to produce the tabulation accompanying the charts, $34,000 for printing the charts, and $5,000 for miscellaneous supplies and materials.

Senator McCARRAN. You have your pay adjustments there again.

Mr. GRUBB. Yes, sir.

Mr. McDONALD. The budget officer had better explain how the pay adjustment is distributed.

Senator McCARRAN. What does that item "Preparation and publication of Northern Hemisphere maps," cost this year?

Mr. GRUBB. From our own funds in the neighborhood of $30,000.

Senator McCARRAN. How near did you come to meeting the necessity?

Mr. McDONALD. We are producing, I would say, less than half that we require, although we are matched in part with military personnel. It is now a joint enterprise.

VALUE OF NORTHERN HEMISPHERE CHARTS

Senator McCARRAN. Whom do you furnish the information to?

Mr. McDONALD. Research institutions, and the military use them in case of need. The only forecasting tool they have for Korea actually is this sequence of charts in which they try to identify a current situa-

tion in the past analogue and then get some idea of what the subsequent weather will be, rather than to work out the techniques of forecasting for such a new area. It has tremendous value as a spot aid to forecasting in a crisis. The military receives a considerable number of these charts.

Senator McCarran. Do those charts ever duplicate themselves?

Mr. McDonald. Never completely. They are like fingerprints. They fall into types to some extent, as fingerprints do.

Senator McCarran. I am wondering what value they are if that is so.

Mr. McDonald. The value comes out of the research into the things least known in meteorology—what constitute the major controls on weather developments; how does weather develop in various ways? We know very little about that. The study of that problem goes to world scale dynamic conditions. We are beginning through these charts and materials of that kind, for instance, to issue with some success a 30-day forecast. I don't know whether you are familiar with that or not, but the Weather Bureau is actually issuing twice a month now a 30-day outlook on weather for the United States that has had so much value as to increase the subscription lists about 10 times in the short period since we began making them.

SALE PRICE OF CHARTS TO SUBSCRIBERS

Senator McCarran. Do you sell those charts?

Mr. McDonald. They are available by subscription.

Senator McCarran. What do you charge for them?

Mr. McDonald. $4.80 a year for 24 issues. The list has grown from 350 to about 3,500 in something like 3 years. That seems to be testimony to its great value and the interest in it. This is a practical byproduct of the kind of researches that are done on a hemisphere scale.

Senator McCarran. Do you not think in the hands of a private concern turning those out, authentic information, the price would have gone up to meet the expense?

Mr. McDonald. Possibly. Publication rates for Government publications are set under a policy that we don't establish, fixed by the rate of production of the publication itself, not the cost of all the studies and background organization that makes it possible.

Senator McCarran. Is there anything else you want to touch on?

EXTENDING PACIFIC OCEAN STATION NETWORK

Mr. Cawley. House Document 100 provides a supplemental item for the Weather Bureau for 1952 in the amount of $475,000. The explanation for that is set forth commencing at the bottom of page 3 of that document, and the Weather Bureau has here today a detailed justification which, if acceptable, we will supply for the record.

Senator McCarran. Is there anything you want to say on that?

Mr. McDonald. I believe the justification is fairly clear and complete, if you will accept it for the record.

Senator McCarran. It has been placed in the report.

(The information referred to is as follows:)

AMENDMENT TO 1952 ESTIMATES

Original estimate	$26,620,000
Change to	27,095,000
Increase	475,000

Details of financial requirements

Personal services (43 positions)	$189,350
Travel	39,140
Transportation of things	36,438
Communication services	200
Supplies and materials	197,772
Equipment	12,100
Total obligations	475,000

The requirement for personal services includes 38 positions for observers aboard ship, 2 for maintenance of equipment, 1 for supervisory and administrative work at shore headquarters, and 2 for processing records of the observations. The following factors determine the total number of observers required for this program: (*a*) Each man will spend 70 percent of his time at sea, which means that 1.43 men are required for full coverage of 1 man at sea; (*b*) the average travel time to and from stations is 1.17 times the number of days (21 days) each ship remains on station, so that 2.17 men are at sea for 1 man on station (1.17+1.00); (*c*) two stations are to be staffed; and (*d*) 6 men are required for full coverage of the observational program on 1 ship, 24 hours a day, 7 days a week. In summary, the formula is: *a* (1.43) times *b* (2.17) times *c* (2) times *d* (6)=37.2 ship observers.

The travel cost consists principally of per diem which must be paid to observers while on board ship, but also includes a small amount for land travel between ports and for station transfers in connection with replacement of personnel.

Transportation of things includes $16,000 for transportation of helium which is used in making upper-air observations, approximately $3,600 for transportation of household goods of transferred employees, and approximately $17,000 for transportation of supplies and equipment.

Supplies required for these stations are mostly for upper-air observations, and include $144,138 for 8,870 expendable radiosonde instruments, $14,000 for 4,000 cylinders of helium, and $39,634 for balloons, batteries, radar targets, and miscellaneous items. The supply cost is relatively large because observations are taken while ships are en route as well as while "on station," in order to realize the greatest benefit from the investment in ships and personnel. The quantity of supplies required is computed by multiplying the number of daily observations per station (four) times the number of days (365), times a factor (1.4) for losses due to rough weather at sea and to defective units, times the number of stations (two), times the number of ships at sea per station (2.17). (i.e., $4 \times 365 \times 1.4 \times 2 \times 2.17 = 8{,}870$ sets of expendables).

Complete replacement of equipment at ocean vessel stations is required in five years. The amount represented, $12,100, is the annual replacement cost.

GENERAL JUSTIFICATION

At present the joint Weather Bureau-Coast Guard weather station program over the Pacific Ocean consists of three stations. This coverage has been found inadequate for the preparation of accurate forecasts covering the western United States, the provision of weather intelligence required for the operation of aircraft over the vast reaches of the Pacific, and the protection of United States installations on Pacific islands and in the Far East.

This deficiency has been recognized by the Bureau of the Budget. Accordingly, the Bureau has coordinated Weather Bureau and Coast Guard plans for the operation of two additional ocean vessel stations in the Pacific. Since the locations proposed for these stations are remote from land bases, six vessels will be required to keep a constant weather watch. Vessels en route to and from the stations will take observations at the regularly scheduled times, thus augmenting weather coverage to a greater extent than would be apparent from the addition of only two locations for fixed coverage.

The proposed stations are consistent with ratified ICAO conventions and Air Coordinating Committee recommendations.

Expansion of the ocean weather program over the Pacific Ocean has been requested repeatedly by civil and military aviation interests. The estimates are based on costs of the present joint Weather Bureau-Coast Guard operation that has been carried on successfully and continuously for more than 10 years in the Atlantic.

Coast Guard plans call for the activation of participating vessels by July 1, 1951; hence, the Weather Bureau must install electronic equipment on the vessels, recruit and train personnel, and procure an initial quantity of expendable instruments and supplies before that date. For this purpose the Bureau of the Budget is releasing a reserve of $125,000 under section 1214. The effect of this program on the Weather Bureau estimates for 1952 as previously represented to the committee, is twofold: First, the total estimated appropriation is increased by $475,000, and second, the release of the reserve in 1951 increases the base for 1952 by $125,000.

Mr. McDONALD. To add to that, this is to extend the network of ocean weather stations in the Pacific in the area where we have the poorest coverage at the present time. I believe, Mr. Chairman, that is all we have to offer.

COLLISION IN GULF OFF KEY WEST, FLA.

Senator McCARRAN. Have you any explanation as to what may have brought about the collision in the Gulf yesterday, off Key West, Fla.?

Mr. CAWLEY. No, sir; I haven't anything I can give for the record now, but the Department will be glad to submit it.

Senator McCARRAN. If you have anything, we would be glad to have it.

Mr. CAWLEY. All right, sir. I will supply it to the committee.

Senator McCARRAN. There was testimony here that there was coordination between the CAA and the Navy. I understand that was a Cuban ship. Am I right in that?

Mr. CAWLEY. I believe so.

Senator McCARRAN. If you can get it for us you might see what they have found with reference to it.

Mr. CAWLEY. I will check on that with CAA.

Senator McCARRAN. That is all for now. We will recess until 2 o'clock this afternoon.

(Whereupon, at 12:15 p. m. the hearing recessed until 2 p. m. the same day.)

AFTERNOON SESSION

NATIONAL BUREAU OF STANDARDS

STATEMENTS OF DR. E. U. CONDON, DIRECTOR; DR. A. V. ASTIN, ASSOCIATE DIRECTOR; DR. W. R. BRODE, ASSOCIATE DIRECTOR; W. F. HARWOOD, EXECUTIVE ASSISTANT TO THE DIRECTOR; N. E. GOLOVIN, ASSISTANT TO THE DIRECTOR; DR. NEWBERN SMITH, CHIEF, RADIO DIVISION; W. W. BOLTON, ACTING BUDGET OFFICER; W. A. STRIPLING, BUDGET EXAMINER, OFFICE OF THE SECRETARY

JUSTIFICATION

Senator McCARRAN. The subcommittee will come to order.

The National Bureau of Standards will be considered next by this subcommittee. I will insert in the record pages 907 and 908 of the justification.

(The justification referred to is as follows:)

Summary of requirements

	Appropriation requirement	Contract authorization	Total
Appropriation 1951 (regular bill)	$9,070,000	$5,675,000	$14,745,000
Proposed supplemental, 1951	1,400,000	−1,760,000	−360,000
Total	10,470,000	3,915,000	14,385,000
Deduct:			
Nonrecurring, 1951 projects	−1,900,000	−3,915,000	−5,815,000
Transfer under Reorganization Plan No. 5, 1949	−161,500		−161,500
Savings under sec. 1214	−150,000		−150,000
Base for 1952	8,258,500		8,258,500

Net difference, 1952 over 1951:

By appropriation	Requirements		Difference, increase (+) or decrease (−)	
	1951 (adjusted)	1952		
Research and testing	$4,150,000	$4,150,000		
Radio propagation and standards	2,900,000	2,900,000		
Operation and administration	1,208,500	1,209,000	+$500	
Construction of laboratories		3,915,000	+3,915,000	
Total	8,258,500	12,174,000	+3,915,500	+3,915,500
Total estimate of appropriations				12,174,000

Summary of obligations by object of expenditure

	1950 actual	1951 estimate	1952 estimate
Personal services	$7,941,363	$5,652,444	$5,618,279
Travel	136,175	231,710	152,185
Transportation of things	52,702	263,247	38,167
Communication services	85,745	27,780	27,910
Rents and utility services	248,965	115,769	115,769
Printing and reproduction	157,120	194,705	194,605
Other contractual services	737,741	685,984	274,564
Services performed by other agencies	169,300	161,500	161,500
Subtotal, other contractual services	907,041	847,484	436,064
Supplies and materials	1,283,533	713,191	769,583
Equipment	678,973	1,643,600	577,730
Lands and structures	724,319	4,382,631	327,631
Taxes and assessments		939	1,077
Total obligations	12,215,936	14,073,500	8,259,000
Adjustments under appropriations:			
Transfers		+161,500	
Comparative transfers	+177,595		
Reimbursements	−3,735,128		
Contract authorization		−3,915,000	
Unobligated balance, estimated savings	+141,597		
Savings under sec. 1214		+150,000	
Applied to contract authorization			+3,915,000
Total	8,800,000	10,470,000	12,174,000

AMOUNT REQUESTED

Senator McCarran. The Bureau is requesting a total of $12,174,000, an increase of $3,915,500 over the current year's appropriation. The total amount requested is divided among several divisions which we shall consider separately after the Director of the Bureau has made his general statement.

Will you proceed, Doctor?

GENERAL STATEMENT

Dr. Condon. Thank you very much, Senator.

I have some chart material which was gotten up with a view of assisting you in understanding our work. I also have here for the convenience of the committee members some copies of the same charts.

AMENDMENT BY CONGRESS OF RESPONSIBILITIES OF BUREAU

We now have an amendment to the basic act that established the National Bureau of Standards. You will recall that the NBS was established in March of 1901 and therefore this is our semi-centennial year. The Congress last year passed Public Law 619 which presents a new statement of our responsibilities as assigned by the Congress. It is natural, I think, that the wording of the original act had become somewhat outmoded because of the great development in science and technology which has occurred in the last 50 years. We must remember 50 years ago there was no radio, practically no automobiles, and certainly no aviation, and practically no chemical industry or anything of that sort. So it was very valuable that the Congress last year adopted a new law stating the work of the National Bureau of Standards in clearer terms.

I have abstracted from the law the main headings of the fields of responsibility. The law codified and made modern statements of the practices that had developed over the years, so there is nothing new in it other than to give a modern, clear statement.

RESPONSIBILITIES OF BUREAU OF STANDARDS

We have the responsibility, as you know, for the standards of scientific measurement, for making the determination of the various technical properties of matter, for the development of testing methods and for carrying out testing not only of materials but also mechanisms and structures and carrying on testing for the Government; cooperation with other agencies, both State and local as well as Federal, in the matter of standard practices incorporated in codes and specifications such as building codes and safety codes; scientific advisory service to the Government; the carrying out of specific scientific development for the Government, or, to quote the exact wording of the language of Public Law 619: "Invention and development of devices to serve special needs of the Government."

The law further specifies a complete list of 19 different more specific activities that are authorized in support of these functions. If you do not mind, I will not read them but will prepare a list for the record so it will be there.

(The list referred to is as follows:)

ACTIVITIES AUTHORIZED TO CARRY OUT THE ABOVE FUNCTIONS

1. Construction of physical standards
2. Calibration of standards and instruments
3. Instrumentation and measurement
4. Interstate commodity scales
5. Uniformity of weights and measures
6. Standard samples
7. Chemical analysis and synthesis
8. High and low temperatures
9. Radiation physics
10. Atomic and molecular physics
11. Standard radio frequencies
12. Radio wave propagation
13. Radio frequency predictions
14. Technical processes and fabrication
15. Building materials and structures
16. Metallurgical research
17. Operation of applied mathematics laboratory
18. Research in physical sciences, mathematics, engineering
19. Publication of scientific and technical data

Senator MCCARRAN. This is only a reassertion of what you have been doing for years?

Dr. CONDON. That is right, sir. It has developed over the years and the understanding as developed in appropriation hearings over the years has reflected the general growth, but the law of 1901 was not a very adequate statement of the actual situation.

LOCATION OF LABORATORIES

I thought you might be interested in having put before you a map showing where our activities are located. As you know, the great bulk of our activities are located in Washington on Connecticut Avenue, but we have a number of stations in the field. A number of them are for the testing of Portland cement and other commodities used by the Government. These are in Allentown, Pa., Denver, Colo., Seattle, Wash., and San Francisco, Calif.

The laboratory in Chicago is headquarters for our testing of railway-track scales that are used in weighing commodities in freight-car lots.

Senator MCCARRAN. What is that in New Mexico?

Dr. CONDON. That is at White Sands. It is one of our radio observation stations.

The ones shown in blue are radio observation stations, radio propagation stations; one in Puerto Rico, one in the Canal Zone, one in Hawaii, two in Alaska. Later I have a chart that shows the radio research stations outside the continental United States.

Then, as you know, there is the site for the Boulder Laboratory which is one of the items before us in this program.

Senator MCCARRAN. We gave you money for that laboratory last year?

Dr. CONDON. Yes, sir. It shows in the budget this year simply as liquidation of contract authority. It was given in the form of contract authority last year, some money for plans and the rest for contract authority, and it shows here for liquidation money.

Senator MCCARRAN. What did you do with that other item that was connected with the Boulder Laboratory?

THE CORONA LABORATORY, CALIFORNIA

Dr. CONDON. The Corona Laboratory at Corona, Calif.?

Senator MCCARRAN. Yes.

Dr. CONDON. I was coming to that. If you recall, that came up in connection with the second supplemental and a special appropriation was given for remodeling that property. Now we have entered into arrangements with the Navy whereby we took, as instructed by the Congress, only a portion of the property, namely, about 100 acres and a small group of buildings, leaving another part of the property for eventual hospital use. Remodeling is now going on and we expect to have the group that are planned to be moved out there really functioning by July or August. This is going along very nicely.

WORK AT THE UNIVERSITY OF CALIFORNIA AT LOS ANGELES

The other one which should be mentioned here is the work that is carried on in Los Angeles on the campus of the University of California at Los Angeles. The work there is in the field of mathematical analysis and mathematical computing services for other Government agencies, especially the military testing agencies in that area.

RESULTS FOR DEFENSE AGENCIES

I will mention to you a few of the things we are doing for the defense agencies because that is one of the most urgent requirements at this time.

As you know, we do a large amount of development work for the Army, Navy, Air Force, Atomic Energy Commission, and the National Advisory Committee of Aeronautics. This chart, the substance of which perhaps could be put in the record, covers a number of those items.

(The information referred to is as follows:)

NBS RESULTS FOR DEFENSE AGENCIES

Army: Proximity fuzes, field X-ray equipment, leathers and textiles.
Navy: Guided missiles, radio range receiver, turbo-jet temperature control, stick force indicator.
Air Force: Computers, S. C. O. O. P., optical lenses.
AEC: A-bomb tests, high-energy radiation penetration, detection instruments.
NACA: Supersonic gas flow, jet-engine blades, jet fuels.

DEVELOPMENT OF PROXIMITY FUZES

Dr. CONDON. The largest single project that we do for the military is in the field of development of proximity fuzes and that is expanding considerably now in accordance with the needs of the military.

Senator MCCARRAN. What does that mean?

Dr. CONDON. The proximity fuze is a device that can be incorporated in any projectile which has a small radio transmitting and receiving set. This is one that I have here. This is an absolete one that is no longer classified.

The general idea of the proximity fuze is that it is a device operating by radio which enables the shell to sense when it is near a target and

cause an explosion without the necessity of a direct hit. These can be used in mortar shells, they can be used in free falling bombs, or in shells that are shot from a rifle or cannon, and also in guided missiles. Now each kind of device brings its own special problems so there is a very large amount of work involved in developing these. These are, by the way, finding use in the service right now.

The guided missile fuzes are very special and much more elaborate. Each one has to be tailored to the special shape of that guided missile. This is calling for a very large expansion of our work. The Navy guided-missile work is to be transferred to Corona.

RESEARCH AND WORK FOR ATOMIC ENERGY COMMISSION

For the Atomic Energy Commission we do a great deal of work in studying the penetration of radiation through shielding barriers and the development of detection instruments such as can be used in civil defense and in general measurement work in connection with the research program of the Atomic Energy Commission.

RESEARCH ON JET ENGINES

For the National Advisory Committee for Aeronautics we are doing work on fundamental measurements of the flow of gases at supersonic speeds and the development of jet-engine blades out of ceramic material to get longer-lasting jet-engine service, and also in chemistry for fuel for jet-engine service.

Senator McCARRAN. What is the life of those jet engines?

Dr. CONDON. I think a good many of those engines have just a few hours of total life—just a few days at the most.

To increase the efficiency of such an engine, one wants to operate it at as high a temperature as possible, but this high temperature, in turn, shortens the life and also makes a great demand on the strategic metals, for example columbium, and others, so there is an engineering balance there that calls for a very careful temperature-measurement control in order to get reasonable life with minimum use of critical materials. It is a very complicated subject right now.

WORK FOR NONMILITARY AGENCIES

What is shown here gives you a bird's-eye view of the work that we do that serves Government agencies in the nonmilitary category.

Senator McCARRAN. I think it is very interesting, Doctor. I wish my colleagues were here to see it.

Dr. CONDON. Of course the same material is contained in this book. We have enough copies so they can be provided with them. Perhaps we had better turn those in right now.

TECHNICAL WORK FOR POST OFFICE DEPARTMENT

We do a great deal of the technical work that backs up the Post Office Department in various matters where they have the responsibility of looking after use of the mails to fraud. This is usually testing devices and chemicals such as those that are supposed to improve the life of the storage battery in cars and various kinds of antifreeze materials. Of course the Post Office Department has the responsibility

for the enforcement of the laws forbidding use of the mails to defraud and they need technical service from NBS in backing up their cases.

TECHNICAL ADVICE GIVEN VOICE OF AMERICA

We have been giving some technical advice to the Voice of America on the improvement of the technical side of their broadcast and relay systems for programs.

CURRENCY COUNTER DEVELOPED FOR TREASURY

I think I mentioned in our hearings last year this currency counter for the Treasury that was just under development at that time. In the time since last year it has been completed. There are now 25 of those automatic machines that count the worn-out currency. This may sound like a trivial thing, but the Secretary of the Treasury estimates that these machines, which cost in total around $200,000, are going to save $250,000 a year. Something like 6 tons of worn-out paper money has to be counted each day to verify that the amount turned in is the amount that people say has been turned in. This machine does that job.

RESEARCH ON PROBLEM OF SMOG

Senator McCarran. I am interested in that first item up there, smog. Once in a while I get down to Los Angeles and I want to get out of there as fast as I can.

Dr. Condon. I was at the point of saying I am sure you do not have any of this in your State.

Senator McCarran. No.

Dr. Condon. Smog is a very serious problem not only in Los Angeles but in certain other cities, as you know. We had one of our chemists working with the city of Los Angeles last summer and he has really made what seems to be the definitive study of what causes the smog. I am sorry I cannot say that this points the way very clearly to what to do to get rid of it. It seems as though it is very definitely connected with hydrocarbon vapors from evaporating oil from refineries which are acted on by the ultraviolet rays of the sun making acid products which are particularly irritating. Of course you know that particular conditions there are such that this material tends to accumulate.

I do not know quite how this is going to help solve the problem, but at least we now know rather definitely what it is due to. This study involved some extraordinarily precise measurement of small quantities of material in large volumes of gas. Quantities of impurity in gas down to the order of a few parts per million million were measured by this NBS chemist in order to find out what they were, what the material was that was causing the trouble.

PHYSICAL EQUIPMENT USED BY MEDICAL PROFESSION

I might just mention another matter of some interest. Ordinarily people do not think of the National Bureau of Standards, as being in the medical field, and it is true that we are not in the medical field in the sense of doing any clinical work with people or with living subjects,

but we do a great deal of work that has to do with physical equipment needed by the medical profession, such as X-ray equipment and in special chemical problems. At present we are doing some chemical work in connection with the Army on the development of blood plasma substitutes. There are materials that have been recently discovered that seem suitable for use in place of blood plasma in the treatment of shock.

One of the top men in the Bureau of Medicine and Surgery in the Navy said that this was extremely important that we get this because it appeared to him that we would almost have to bleed everybody to get enough plasma in order to save their lives if we did it the old-fashioned way. But we hope this will work out well.

DEPARTMENTS REQUIRED TO PAY FOR STUDY, RESEARCH, AND REPORTS

Senator McCarran. Right there, Doctor, this question suggests itself. These departments call on you for study and research and report on these various subjects. Do they, in turn, pay your Department for the time expended?

Dr. Condon. Yes; that is right. The budget before you refers to the basic program of the Bureau. But on all of these special things that are done for other agencies we serve them in a contracting relationship and their funds provide for it. Likewise this assures that we do not start doing things for them that are not really wanted. This makes sure that the work is done in close relation to the using agency.

Senator McCarran. Now taking the budget, do you get to the point somewhere along the line where you can tell us how that money is applied, because the money that does this work does not come through here at all.

Dr. Condon. It is not on that statement, but it is in another statement in the President's budget. As I think you may recall, last year there was a new fiscal arrangement by which a working-capital fund was set up at the Bureau to handle transfers.

Senator McCarran. What I want now is to try to distinguish between the work that is done with the money we appropriate in this bill, in this budget that is before us here, and the work that is done with money brought in by other departments.

Dr. Condon. What I have been presenting is in the nature of a general statement. I am coming now to the first item of the appropriations by titles.

AMOUNT REQUESTED FOR RESEARCH AND TESTING

The first specific title is the one under the heading of "Research and testing," which accounts for $4,150,000 of the total. Now, as I think you know from previous years, we are organized into operating divisions by branches of scientific subject matter. The titles of those divisions indicate the field of work they are engaged in and the list of them is shown here. We can insert the list in the record

(The list referred to is as follows:)

SCIENTIFIC AND TECHNICAL DIVISIONS OF THE NATIONAL BUREAU OF STANDARDS RECEIVING SUPPORT FROM THE APPROPRIATION RESEARCH AND TESTING

Applied mathematics
Atomic and radiation physics
Building technology
Chemistry
Electricity
Electronics
Heat and power
Mechanics
Metallurgy
Mineral products
Optics and metrology
Organic and fibrous materials
Scientific publications
Weights and measures

Dr. CONDON. What we have shown here, to assist you in getting some notion of the expenditure of the total sum by broad categories of work, is to break it down into headings by the nature of the work.

BREAKDOWN OF FUNDS FOR RESEARCH

There is $766,124 for fundamental research; $770,981 for applied research; $934,748 for development—that is, development of new instruments and test methods—$1,078,992 for actually carrying on testing and calibration and development of specifications; and $599,155 for various scientific services to the Government.

Senator MCCARRAN. Before you leave that, from what you have just said with reference to this chart that is before us at this time and the money that is expended under those headings, that money is not expended for work that comes in from other governmental departments. Am I right on that?

REIMBURSEMENTS FOR TESTING AND CALIBRATION SERVICES

Dr. CONDON. Some of this work on testing and calibration, which is in the nature of calibrating thermometers and scientific instruments, we do under the law for other Government departments without charge to them, without reimbursement from them.

The part that is reimbursed by the other departments is testing commodities such as portland cement or things of that sort and likewise where the project involves the development of a new invention or development of a new specific device for their purposes like the guided missile or currency counter, development work of that kind.

QUESTION AS TO PAYMENT OF COSTS BY OTHER DEPARTMENTS

Senator MCCARRAN. Why should not that all be paid for by the respective departments or why, on the other hand, should the respective departments pay for any of it? Why do we not make the appropriation through this budget for all of it or make the appropriation for all of it through the respective departmental budgets?

Dr. CONDON. It is a very complicated situation to which we have given a lot of thought.

Senator MCCARRAN. I am trying to get out of the confusion.

Dr. CONDON. I will see if I can say some things that will be helpful on that point.

In the first place, the legislation says we may do the basic calibration services without charge, so from our point of view we do it

because that is what the law says. One could go behind that and ask if that is a good arrangement. That is another question.

On the service involving commodity testing, it is my belief that in all cases the agency concerned should pay for it and it should be thought of as a valid element of the cost of the purchasing process. For instance, on portland cement it would be extremely difficult for us to estimate how much we ought to put in our budget to cover the cost of testing portland cement because we cannot know how much cement procurement there is going to be in any given year. That depends on the magnitude and timing of the public-works program. So, from the point of view of budgeting practicality I do not think it ought to be there. Secondly, it is really an element of cost in the public works program that used the cement. That is where the cost ought to be.

On the other hand, the vast amount of testing that we do adds up in the aggregate to a lot, but where we do a quick job of testing a few samples, or things of that sort, it would be more bookkeeping than it is worth if we had to put through vouchers and charged for every bit of that.

So my recommendation would be that we should work in the direction of having all the test work paid for by the agencies served with some leeway so that we do not make bookkeeping charges for some of the small items.

Senator McCarran. Now you can take exception to this because I do not have any extra knowledge of it, but the thought strikes me that arrangements could be made where all the Government would do with reference to the Bureau of Standards would be to set the Bureau of Standards up and equip it thoroughly to carry on the work that would be sent to it from the departments.

Dr. Condon. That is right.

Senator McCarran. That is putting it rather crudely.

Dr. Condon. I think that is a very good way of putting it. We should be equipped and we should develop methods and we should be competent to do the job.

Senator McCarran. And you should be staffed, of course.

Dr. Condon. Yes, but they should pay the cost.

Senator McCarran. It should be either that or else say: "We will finance the Bureau of Standards, come on with your testing, come on with everything you have from all your departments, and there will be no charge at all."

Dr. Condon. I think the objection to that that might reasonably be raised would be twofold. In the first place, it is not good accounting practice in the sense that the cost of making the test is really an element of the cost of the job and procurement of the materials, and ought to show where it is used. But there is also the difficulty that we would have in trying to come honestly before you with a valid estimate of what our workload was going to be because we would have no way of knowing until these fellows gave us work.

Senator McCarran. The only trouble with the present system is that there is in every department an appropriation that is either tucked away somewhere or out in the open—frequently it is tucked away—which contemplates that a certain amount of work is to be sent to the Bureau of Standards, and we are appropriating for that work in that department. We never see the result of it until we hear from you,

and we call on you and ask you how much you did receive from such and such a department, what work did you do, and so forth.

Dr. CONDON. Yes; and there is a sense in which that is quite reasonable. We were talking about the testing. Take, for example, development work on some special requirement for the National Advisory Committee for Aeronautics.

Senator MCCARRAN. It struck me when I saw that we make heavy appropriations for this laboratory down here at Langley Field and the one out in the Middle West and the one out in California. It seems to me they should do all that work. That is the reason we set them up. Here we find it is done by you.

Dr. CONDON. You must realize we are very closely cooperative. Actually the head of the National Advisory Committee for Aeronautics is a former Associate Director of the Bureau of Standards, Dr. Dryden. We know each other very well. We have determined that some of the work can be done most expeditiously and efficiently by using our facilities rather than their duplicating them. On the other hand, the particular work in that instance, for example, is something that specifically serves an aeronautics need and often is just a small component of a larger program where they need some special information to fit in with something else going on in their laboratories. For example, I think that this year the amount for the National Advisory Committee for Aeronautics is about $200,000 that they transferred to us. Actually, of course, as you know, their whole program is many millions. So this is just a question of doing some specific details that fit their largest needs.

Senator MCCARRAN. I want you to understand I am not critical. I have been looking at this for a long time and other members of the committee have been looking at this for a long time to see if we cannot devise some means whereby there would be a better check on the public funds expended than what we get by, if I may term it that, a rather loose way of doing it, and a better system for economy. If this is the best system for economy, fine and dandy; if it is not, and some better system for economy can be worked out, that is what we are looking for.

Dr. CONDON. My own feeling is that it is working very satisfactorily in this respect, that the things we do for other agencies are things which correspond to the needs that they justify to you for their over-all program. I should think it would be very unreasonable for me to come up before the Congress suggesting you should give us some funds for proximity-fuze development because that would be completely independent of and uncoordinated with the military program; but when the military develops their needs and find they are needed and subsequently find the best way to get that work done is to ask us to do it, that seems to me a really rational way to do it, if I may say so.

Of course, as you point out, it is essential and it should be part of the basic program to have the staff and to have the facilities so that these services can be rendered.

CEMENT AND PAINT TESTING

If I might take just a moment before we leave the testing, I feel this is a subject to which the Congress might very well give special attention, because I do not feel that an adequate job of testing the

commodities used by the Government is being done. I have a tendency to mention portland cement and also electric lamps, because those are the two commodities where we are doing an adequate job.

Senator McCarran. Now with reference to portland cement, are there not tests made on every job, tests made daily, and not by your Department at all?

Dr. Condon. The portland cement used by the Government is put in large bins at the cement mill and bonded and then samples are drawn for us to test before it is accepted for Government projects. I might say that my impression is that between 20 and 30 percent of the material so tested is rejected, indicating if we were not doing this testing work the Government would get some inferior cement in public works projects.

Senator McCarran. You say that comes to you out of a bonded and sealed bin?

Dr. Condon. Yes.

Senator McCarran. And then you find 20 to 30 percent of that which comes to you is rejected?

Dr. Condon. We reject it if we find it is unsatisfactory.

Senator McCarran. Then somebody out there in establishing those sealed bins must be slipping up to beat the band. Is that a private concern out there? Is it a Government concern?

Dr. Condon. These are manufacturers. The cement mills make it and seal it up until our samples can be drawn and then we make the test, and if it is satisfactory we release that as suitable for purchase by the Government. The same sort of thing is done with some other commodities but not nearly as much as one might think. I can give you an example.

LOSS TO GOVERNMENT BY FAILURE TO TEST ALL PAINT PURCHASED

I will mention some very round numbers for which I would not like to be held to precise detail, but we test about $1,000,000 worth of paints a year for the Government. We reject about 30 percent of it. The Government, however, buys something of the order of $100,000,000 worth of paint a year and the great bulk of that is not tested. I contend that if we are rejecting about 30 percent of $1,000,000 worth of paint a year, that is a fair Gallup poll way of finding out that is about how it runs and therefore I would be willing to take the position and try to support it that the Government is losing on about $30,000,000 worth of paint every year by not having an adequate testing program on that commodity. That is a subject on which I feel very strongly because I am sure that the annual losses to the Government run many times over the cost of operating this.

Senator McCarran. When the Government is putting as much money into your Department as they are it seems to me they ought to make greater use of your Department to protect them against this loss you mention, using paint as an illustration.

Dr. Condon. We try to divide the program up in such a way as to meet the most urgent needs in each of the fields. If we were to do more work on paint, we would neglect something else which is equally important. It is one of those things when one tries to make as reasonable a balance as human judgment allows.

I suspect I should run over these things rather rapidly.

DEVELOPMENT OF LENGTH-MEASURING MERCURY LAMP

I thought you might be interested to know we have developed in the last year or two a very precise method of measuring length that involves the use of special mercury lamps using mercury 198. Mercury 198 is a special sort of material that is made out of gold by nuclear reactions in the reactors at Hanford and Oak Ridge. This makes possible measurement of length much more precise than they have every been made before. As a matter of fact, the standard meter which has always been the definition of the unit of length is really obsolete because by this optical method we can measure more precisely than we can measure by that meter.

Senator McCarran. The standard meter has been held in a very carefully guarded safe, has it not?

Mr. Condon. Yes, and we still do that, because it is the present legal basis of our measuring system, but I think the techniques that are now being developed will mean that we will be coming before you with legislation to catch up.

Senator McCarran. Will the yard get any shorter or longer?

Mr. Condon. The yard is defined relative to the meter. We will try to keep them the same. I think we can do this at least to 1 part in 100,000,000. This of course will be much closer than the way the present method allows.

COMMODITY TESTING

When on the subject of testing, I should have turned at once to this chart. With your permission I would like to supply this table for the record because though I speak of the inadequacy of the over-all program I would not like to leave you with the impression there is not a very large amount of work done.

(The information referred to is as follows:)

Testing and calibration services performed in fiscal year 1950

Electricity:	
Calibration determinations	14, 000
Lamp bulbs sample-tested (5,000 samples)	4, 000, 000
Optics and metrology:	
Calibration determinations	20, 000
Microfilm samples	2, 500
Heat and power:	
Laboratory thermometers	3, 078
Thermocouples	289
Clinical thermometers	11, 819
Atomic and radiation physics:	
Radium and radium compounds	2, 140
Radon measurement	898
Radioactive standard samples	1, 076
Chemistry:	
Spectrographic analyses	3, 775
Paint, soaps, metals	2, 143
Standard samples	13, 000
Mechanics:	
Fluid meters	1, 505
Hardness tests	1, 267
Pressure gages and barometers	100
Organic and fibrous materials:	
Rubber, plastic, leather, textiles	11, 940
Standard sample (rubber compounding ingredients)	3, 400

Testing and calibration services performed in fiscal year 1950—Continued

Metallurgy:	
Special castings prepared	1,033
Quality of metal specimens	311
Specimens heat-treated	322
Mineral products:	
Barrels portland cement sample-tested (5,000 samples)	9,000,000
Aggregate samples	300
Cement laboratories inspected	65
Building technology:	
Bituminous materials	2,100

More than 250,000 tests and calibrations. More than 20,000 standard samples.

TOTAL TESTS AND CALIBRATIONS DURING YEAR

During last year there were done more than 250,000 different tests and calibrations in the Bureau of Standards laboratories, and more than 20,000 standard samples of chemicals were supplied to other laboratories in order that they could control their analytical test methods.

TESTING OF LIGHT BULBS AND FLUORESCENT LAMPS

The break-down indicates, for example, that some 5,000 light bulbs were tested on a sample basis for the purpose of deciding on the purchase of 4,000,000 lamp bulbs by the Government for use in Federal buildings.

Just to take another example, we tested 2,143 samples of paint, soaps, and metals, but there were not enough samples of paint to cover the material adequately. Eleven thousand nine hundred forty samples of rubber, plastic, leather, textile materials affecting purchase of supplies by the Government were tested. Of course 5,000 samples of portland cement were tested, providing the basis for judgment on the purchase of 9,000,000 barrels of portland cement for Federal projects.

One of the confusing elements in many people's minds about testing is the failure to recognize that the economic loss involved in the acceptance of a poor material is much greater than the cost of that material, as of course you know, because if you build a dam with poor cement you have lost a lot more than the cost of the cement. If you paint a building with poor paint, in labor and other costs you run into much greater cost than simply the loss of the value of the paint. So I think there is great opportunity for improvement there. We are doing the best we know how on this.

These pictures here I think may be of some interest. This shows our light test racks for the testing of lamps for the Federal Government on which we burn the lamps to see how long they last. There are many other tests besides these which are performed. Some of the lamps for the Navy of course are especially built because they have to stand the shock of gunfire and recoil on the ship and have much more severe tests that they have to pass than lamps for ordinary use.

We also have besides this laboratory a large laboratory for the measurement of light and photometric properties of the fluorescent lamps that are recently coming to be used so much.

This is a scene in a laboratory where radon testing is done. I think you may remember some years ago when there were difficulties about

the health of workers who had been handling radium and ingesting some of the material. Their breath samples are sent to the Bureau where sample measurements are made as part of the public health program.

SETTLING OF SCREW THREADS DIFFICULTY BETWEEN GREAT BRITAIN, CANADA, AND THE UNITED STATES

I was rather surprised myself the other day to hear a figure about the economic loss that was occasioned during World War II, because the British and the United States did not use the same screw threads on nuts and bolts. The loss was estimated to be about $100,000,000 because British and American screw threads were not interchangeable. We worked on that a great deal in the last year or two, the years since the war. A year ago we worked out and signed a declaration of accord between Great Britain, the United States, and Canada by which the screw threads are now being made interchangeable as between these three countries. It not only saves a great deal in money but it increases actual military effectiveness a great deal not to have that source of annoyance in military supply depots.

OTHER TESTS ON WEIGHTS AND MEASURES

These pictures may be of some interest. I alluded to the fact that Chicago is the headquarters for track scale calibration work. This picture shows our railroad car. We have two. One is not in very good condition any more. They are equipped with a crane for handling very large weights and they are used in going around the country assisting the local governments in the calibration of the railway track scales used in commerce. These others are the scales used in checking the platform scales for trucks.

In general the weights and measures administration is a matter of local jurisdiction as far as checking up on the accuracy of gas pumps and local scales. We assist these people in the technical services but do not have the responsibility of policing. We do this work on railroad calibration even though the enforcement aspect is a matter for local jurisdiction.

Now this is the end of the material that I had prepared covering the first topic.

AMOUNT REQUESTED FOR RADIO PROPAGATION AND STANDARDS

The second title, which is on your summary sheet, is the one referring to "radio propagation and standards."

The amount we are requesting for next year is $2,900,000, which is the same as we have had this year.

Senator McCarran. What was it this year?

Dr. Condon. It was originally appropriated as $3,000,000, but $100,000 was reserved under section 1214.

This work refers to the understanding and better utilization of radio for all kinds of purposes, not just commercial broadcast, but all long-range communication, both military and civil, and the use of radio for aerial navigation, signaling, and other military purposes.

Senator McCarran. In addition to the $2,900,000 that you had, how much money did you receive in this department for the work done for the departments?

Dr. Condon. In this particular area very little. I will have to ask Dr. Smith. There was one cooperative program that amounted to several hundred thousand dollars, for special duty for the Air Navigation Development Board looking toward a more efficient utilization of radio for airplane navigation systems in the future. As I think you are aware, the radiobeacon system that is now in use is getting rather saturated, and as we get more traffic on the airports the present system will not serve this country for many more years. So, some experimental work on new systems has to be done. Although this is supported by the military in the sense of their being back of it and working cooperatively with us on the program, in this instance nearly all of it comes from this appropriation as contrasted with the situation in some of the other items.

Can you give us some more exact figures, Dr. Smith?

TRANSFER OF FUNDS RECEIVED

Dr. Smith. We have $200,000 from the Air Navigation Development Board and $100,000 from the Signal Corps and $20,000 from the Coast Guard. I think that is the total amount.

Dr. Condon. Yes; what was the Signal Corps amount?

Dr. Smith. $100,000.

Dr. Condon. This work really falls into three main categories. The long-distance radio communication is by reflection from a high upper layer in the atmosphere that is several hundred miles up, which is called the ionosphere, and any waves that go up to there and are reflected down we speak of as being propagated ionospherically. Waves of very high frequency are not reflected by the ionosphere but they are affected by meteorological phenomena, the humidity of the air, where there is actual precipitation, and also by the temperature distribution. We refer to those phenomena as tropospheric. They play a useful role in microwaves for airplane landing systems. It is important that one knows all about these factors in order to make the most effective use of radio.

In addition to that which has to do with the propagation part, of course our basic function in carrying out electrical measurements of all kinds requires the development of electrical measuring devices and the calibration instruments for general use at radio frequencies. This has really become a very complicated field since the war because radio is becoming more of an exact science so that the demand is for more exact measurement than had hitherto been acceptable, and also the range of frequencies is greater as they use higher and higher frequency microwaves for radar purposes. Some of the things we do under this heading are indicated here.

One of the limitations on the use of radios is the fact that there is always background noise, not only the static man-made noise such as comes from automobile ignitions, and so on, but there is a great deal of noise that comes all the way from distant stars. That acts as background no matter where you are and limits the distance at which radio signals can be heard above that noise. These are interesting phenomena in terms of basic science. It comes from certain

stars and certain places in the sky. We are just beginning to find out about it. Very little is known at present as to what really causes it.

Likewise radio noise comes from the sun, but apparently in altogether different magnitude. That is to say, the noise that comes from the sun is not vastly greater than that that comes from the stars, so the sun must be an unusual star in that it so very quiet. If the sun made as much noise as some stars do, in view of how close it is, we just could not use radio. But nevertheless, even though it is quiet compared to other stars, it does make noise and it is important to understand that as a limitation on the propagation.

OVERSEAS RADIO STATIONS

I referred earlier to the fact that we had overseas radio stations in addition to the ones that were shown on the map of the United States. This map shows the distribution of those overseas stations more adequately besides the ones that are in the United States for making obervations of the ionosphere, measuring its height and how it varies between day and night. We have these overseas stations that are supported by this appropriation, one in Hawaii, one in Guam, in Anchorage, in Fairbanks, and in Point Barrow, Alaska; one in Iceland that is operated by contract with the Icelandic Government, one in Greenland, one in Bermuda, one in Puerto Rico. The Trinidad station is being discontinued inasmuch as the same information can be gotten adequately from the station in the Canal Zone. There is one operated by contract with the Peruvian Government at Huancayo. Here are pictures of them. They are simple little structures and have four or five people there to take standard observations. Wherever possible we operate these in connection with other Government activities in order to cut down the cost of servicing them and to get the information in the cheapest way possible.

EXCHANGE OF INFORMATION WITH OTHER COUNTRIES

This is really a matter of a world-wide program. Besides these stations other countries that cooperate with us operate a total of about 60 such stations and we exchange data with them. The principal ones are of the countries of the British Empire, Australia is very active in this field and provides us with data, India does likewise, as do Great Britain and Canada. There is cooperation also with the other western European countries.

This method of studying the ionosphere is very similar to the idea underlying radar. We send the pulse of radio straight up and it is reflected at some height above the earth's surface and comes back down, and the time of delay indicates how high the reflecting layer is. Since it is a question of a thin layer that is above the earth's surface, that indicates in combination with the curvature of the earth how great a distance you can propagate a radio wave from here to here by reflection under these conditions. You can see if the mirror was too low, you could not get around the earth's curvature as well as if it were high. Observations of this sort are made at various radio frequencies from one megacycle up to about 16 at all these different stations.

We are trying to learn the scientific factors that underlie changes between day and night and different geographical conditions at different times of the sun spot cycle. When there are lots of sun spots the situation is quite different than when there are a very few. So all of this has to be put together to produce predictions of how the ionospheric behavior will be. We issue predictions 3 months in advance. These are widely distributed to the whole communications industry and also to all of the branches of the military services.

Now, as with all things, when one tries to predict the future, he does not get it absolutely right. I think that is the general principle. So we then have to get out monthly revisions if there are detailed things going out, weekly forecasts, and finally when something very special happens like a sudden outbreak of a sun spot that we can tell will in a very short time interrupt radio communication, we send out telephonic warnings.

Observations of the sun are made for us at the Mount Wilson Observatory and at Climax, Colo., and those observations are telegraphed in to us and warnings are given to all users of radio that they can adjust to it.

EFFECT OF SUN SPOTS ON RADIO RECEPTION

Senator McCarran. Do sun spots affect radio reception?

Dr. Condon. Very much, yes; in this field particularly. It seems to be a matter of the ultraviolet light from the sun so that even though the sun spots make very little change in the brightness of the sunlight as we see it, it makes a great change in the ultraviolet which in turn affects the atmospheric propagation.

Senator McCarran. What is the sun spot? What is the cause of it?

Dr. Condon. I wish I knew. This is what they look like. This happens to be a relatively spotty condition. There is an 11-year cycle. They come up to maximum and then by the end of the 11 years they go way down and you will have a period when there are practically none, and then they build up a lot, and so on.

There is even a trickier feature about this 11-year cycle in this respect. Most of the sun spots have a sort of spiral character by their rotating in a certain sense. When they build up the next 11 years they are rotating in the opposite sense, all of them or most of them statistically, and 11 years later they build up in the opposite sense. Nobody knows why. We would like to know. It is a very complicated problem.

These things have been under observation in a way, so far as visual observations are concerned, for well over 100 years, and astronomers have given a great deal of attention ot it, but it is very poorly understood even yet.

WORK ON CHEYENNE MOUNTAIN, COLO.

These pictures show the arrangement that has been made for the experiments on Cheyenne Mountain, the mountain just back of Colorado Springs, for the work that was started partly for the Air Navigation Development Board and partly because of our fundamental interest in tropospheric conditions. Our study deals with

100 to 425 megacycles. In addition, the work for the Air Navigation Development Board is work with 1,000 megacycles, and by combination we get the same information in the over-all installations. Since these are mostly used for air-ground and ground-air communications either as message communications or navigating devices for airplanes, we wanted a situation that would rather resemble a permanent airplane stuck up in the air, and for that purpose a good steep, sharp mountain is desirable. If you are familiar with the country, you know how abruptly Cheyenne Mountain rises above the plains. We have one set of transmitters at a 7,500-foot elevation, half-way up, and the other at the summit of the mountain, about 9,000 feet, and several receivers at various distances, approximately 50 to 100 miles to the east and a mobile receiving station that can run out still farther, the object being to learn how the propagation of these signals go at all different times with regard to meteorological conditions in order to know how reliable these frequencies would be for use on an air-navigation system.

I alluded to the fact that another phase of the work is the development of measurement standards in the provision of measurement service. Now, in the case of radio, of course, some of the measurement service can be done not by having people bring their equipment in to us but by us sending out the information that they need. Out at Beltsville, Md., we have a radio station WWV which sends out radio signals all the time, 24 hours, which serve all of industry for time standards and also for frequency standards.

These are used in a very wide range of applications not only in checking up on the frequencies of communications so that other radio stations can check their own frequency and all of the different kinds of radio applications but in scientific laboratories our time signals are used by geophysical exploration parties as the time base for measuring their seismic wave propagation when they are exploring for oil by seismic methods. They will get their time signals by tuning in on this station wherever they are and using that to measure the propagation of the artificial earthquake wave set up in looking for oil.

Audio frequencies are actually used for checking up on the tuning of musical instruments so that, for example, it is possible for musical instruments in different parts of the country to be brought into a standard condition by comparing their calibration with the tuning of them with the standard musical notes that we put out.

These are the standard radio frequencies that are being broadcast continuously so that they can be used for checking up on radio frequencies of various sorts.

SERVICE EXTENDED TO PACIFIC AREA

In the last year or two this service has been extended into the Pacific area, where WWV does not reach very well, by the establishment of WWVH located in Hawaii. It is a simpler thing, and operates a simpler service. It actually operates on lower power but it does give a very adequate service over the entire Pacific area reaching clear to Asia and also up into Alaska and the South Pacific as well.

Now may I introduce into the record a statement from the Department of Defense concerning this phase of the budget?

(The statement is as follows:)

STATEMENT IN DEFENSE OF CENTRAL RADIO PROPAGATION LABORATORY BUDGET FOR THE FISCAL YEAR 1952

The National Defense Establishment, in supporting the wave-propagation programs of the Central Radio Propagation Laboratory, National Bureau of Standards, foresees an increasing demand for aid on the part of this laboratory in obtaining the necessary basic propagation data to meet military operational and research requirements in the fields of radio communications and electronic navigation systems.

Requirements for basic radio-propagation data have increased along with the expansion of military activities and, due to the present international situation, results from this program must be available within a much shorter period than was originally contemplated.

It is to be noted that the Central Radio Propagation Laboratory program covered by the fiscal year 1952 budget will not fulfill all requirements of the military. Therefore, it is necessary to include, in military budgets, additional funds to be transferred to Central Radio Propagation Laboratory in order that their program may be increased under directives of the Bureau of the Budget concerning nondefense agencies.

This budget has been reviewed by a committee of representatives of the interested military services, and it has been determined that this program is essential and is required in order that the military services may have the necessary wave-propagation data to accomplish their responsibilities in this very important field.

W. T. GUEST,
Brigadier General, United States Army.

Now that concludes the material that I had intended to present as giving an indication of the work on radio propagation.

AMOUNT REQUESTED FOR OPERATION AND ADMINISTRATION

The third title that I want to come to briefly now is the one headed, "Operation and administration, $1,209,000." I think that is identical for this year except perhaps a few hundred dollars that we are rounding off. It is just a small round-off, but otherwise identical with this year.

This provides for the basic administrative costs and for the maintenance and operation of buildings and grounds out there and for certain alterations and improvements in those buildings and grounds.

As you know, this committee has very generously supported for several years past the rehabilitation of the electrical system out there.

Senator MCCARRAN. I was wondering how that was. We made a special appropriation for it last year.

Dr. CONDON. Yes; it was a continuing matter over several years. It is essentially completed now, and we are very happy with it. There is some room for judgment there. We cut short by just doing major permanent buildings. In some respects it would be better if we did some improvements on some of the temporary buildings but there was the question of whether it was wise to invest money in improvements on what we hope will be temporary structures.

The major item here is for alterations and improvements. That is to make some improvements in the steam-distribution system which is also quite old and giving unsatisfactory service. The appropriation that we have this year, fiscal 1951, has made it possible to arrange for some measure of improvement in the powerhouse, the new boilers for the powerhouse, but we also hope that we can be allowed to continue with this rehabilitation. Provision was made for a new boiler

last year and that is now being taken care of. We would like to continue with a few other improvements on the basic plan.

Now I think you know that this sum for operation and administration covers the administrative cost associated with the basic program. In addition, there are some funds made available for these same general purposes in the form of a modest overhead charge of about 15 percent on the funds provided from other Government agencies for their projects. The feeling is they should bear not only the cost of the work but their proportionate cost of the personnel actions and other administrative items that are made necessary by their work.

Senator McCarran. Why does not the Public Buildings Administration handle the maintenance and operation of your buildings?

Dr. Condon. This is a matter that has been discussed a great deal over the years. It was done for several reasons before I came to this position. We have often considered the question whether that would be a better arrangement even now. The argument for the present system is that in our case our buildings are such very-special-purpose ones, the laboratory equipment is in many cases part of the building itself, and the distinction between building service and technical service as part of the experimental work is a very difficult one to maintain. I think the feeling is that they do not think they are equipped to do the job when it has those technical features. That is it in a broad way. Of course there are some details to be considered. It would nevertheless be possible to have the Public Buildings Service operate the guard service or a few items of that sort, but then the present arrangement seems to be working quite satisfactorily so that we do not feel like changing it.

TOTAL PERSONNEL OF BUREAU OF STANDARDS

Senator McCarran. What is the number of your personnel all told?

Dr Condon. All told now it is about 3,600. I can get it more accurately.

Senator McCarran. How many are in Washington?

Dr. Condon. I would say nearly all but two or three hundred are in Washington. You see, these outlying activities are of the kind that have only a few people at each place. That situation of course will change as we move approximately 150 to 200 to California this summer and later when the radio laboratories are developed in Colorado that will involve 300 to 400 going there.

Senator McCarran. Moving from here?

Dr. Condon. Moving from here, yes.

Senator McCarran. Are you asking for additional personnel this year?

Dr. Condon. Not on this appropriation, no. Of course with the expanded military requirement for special military budget work there will be extra personnel that goes with that project work.

Senator McCarran. You are not contemplating that right now?

Dr. Condon. Additional military work?

Senator McCarran. Yes.

Dr. Condon. Oh, yes, there is a great deal of it we are asked to do. We are doing our best to carry the load.

Senator McCarran. Does that involve additional personnel?

Dr. CONDON. It is very hard for us to estimate exactly what that will be because, you see, that takes the form of being matters that are conditional on the passage of their appropriations to determine what they are able to do, but I would expect there might be as many as four or five hundred additional personnel in meeting the requirements that they have indicated that they will ask us to take on.

PART-TIME AND TEMPORARY EMPLOYEES

Senator MCCARRAN. Under personnel service you have part-time and temporary employment. What do they do? In 1950 it was 53.5. In 1951 it is 37.7. What is the average employment? That is on page 909.

Dr. CONDON. The part-time employment is distributed over the entire activity. They are consultants who have very special skills that we get from universities. We bring in some summer student employment from colleges to get people to help out on special jobs.

PROJECT COST ACCOUNTING SYSTEM

One of the changes this year that those who are particularly interested in management improvement will find interesting is a project cost-accounting system. This has been carefully worked out not only by our own staff, for the purpose of finding out what would fit the scientific needs most adequately, but also by cooperative work with the experts of the Department of Commerce, the Bureau of the Budget, and the General Accounting Office. I think you recall that last year in connection with the deficiency appropriation a working-capital fund was set up. Now we have an accounting system that indicates costs by the specific technical projects and by the specific administrative projects. This enables us to have a much closer management control over the details of the expenditures and to know where we are at all times in a much more effective way than was possible before. This is a very genuine improvement. It was put in only at the beginning of this fiscal year, and it won't be until we have had 1 year's experience with it that we will know in detail how helpful it is, but I think it is going to be very helpful.

There are other things that we have done. We have a systematic method now for getting all of the work reviewed, all of the projects reviewed on a periodic basis, with regular reports, with a clearly defined set of task objectives for each of the projects. We are closely coordinated both with regard to the use of personnel and with regard to the use of facilities to cut down any possible duplication, accidental or otherwise, on matters of equipment and to make the most effective use of the space and facilities.

QUESTION OF DUPLICATION OF WORK

Senator MCCARRAN. On the question of duplication, do you find any duplication of your work being carried out by other departments of the Government?

Dr. CONDON. No; I don't think I know of any. I must admit that sometimes, when one first approaches a subject, things seem like they are. For example, the radio work is such a very complicated field,

with specialized electronic equipment needed by all branches of the service for various special purposes, that if you look at it superficially it may seem as though they are all doing similar things. They are similar and related, but one of the things that has been developed very adequately, I think, in the last few years has been a systematic and careful committee work between the military and ourselves through this special group known as the Research and Development Board of the Department of Defense, whereby all of the laboratories are in close touch with what the various ones are doing to eliminate duplication.

This is perhaps a point that is not always understood. Every scientist, of course, wants his lab to do a good job and to have a lot to work with, and so on, but nobody wants to do what somebody else is doing. Nobody wants to duplicate. So the men, while they may show a certain amount of eagerness about building up their particular institution, always strive to do that in a way that doesn't involve doing the same thing that they know somebody else is doing. There is no fun in that, you may say.

So, I think the situation is very good in all of the areas that I have any contact with.

I believe, sir, that is all that we had in mind to say.

EVALUATION OF PROFESSIONAL PERSONNEL

Senator McCarran. That last item catches my eye, "Evaluation of professional personnel." What do you mean by that?

Dr. Condon. We have, of course, a number of aspects to that. We have a Professional Personnel Committee in the central management of the Bureau. We get quarterly reports from every one of the members of the professional personnel indicating what he did during the quarter on each of the projects on which he is engaged. These matters are carefully taken into account in the matters of review with regard to assignment of men to new projects as they come up or as deserving promotion within the organization, so that our own people can be given the best opportunity to develop.

Senator McCarran. In your particular line of work, a man can't be judged by the volume that he turns out; can he?

Dr. Condon. No, sir. We have to pay a great deal of attention to questions of the quality and nature of it, its complexity, and a great deal, of course, is done to judge a man by his rate of development. That is, is he not only doing a good job, but is he dynamic and progressive in learning new things and getting better, or is he leveling off? Of course, the men which we would like for our type of work as important members of the staff are the ones who are getting new ideas and not just simply doing a routine service job.

There is another feature of the work that is important, and I think it is especially important at this time. The shortage of technical personnel is so great for all of the scientific work of the country that we are operating quite a program, out of hours largely, of educational courses in order to assist the men in the development of their own professional growth. There is quite a large number of our staff who are registered for graduate work in the local universities and who are continuing on for advanced degrees. We try in every way possible to encourage their maximum professional development on the job.

Senator McCarran. Will you please furnish for the record a statement showing how much money you are asking for each category of appropriation, in the next column the amount you expect to be transferred to you from other Government departments, and then a total column showing the total? Also please furnish the same figure for the current fiscal year.

Dr. Condon. Yes, sir; we will be glad to do that.

Senator McCarran. Will you have that for us?

Dr. Condon. We will prepare that.

(The information requested is as follows:)

Estimated obligations, fiscal year 1951, by source of financing

Activity	Appropriations for the National Bureau of Standards [1]			Transfers from other agencies	Total
	Research and testing	Radio propagation and standards	Operation and administration		
1. Fundamental research	$766,124	$215,986		$617,890	$1,600,000
2. Applied research	770,981	458,101		1,870,918	3,100,000
3. Development	934,748	1,362,357		21,702,895	24,000,000
4. Testing, calibration, and specifications	1,078,992	18,697		802,311	1,900,000
5. General services	599,155	844,859		855,986	2,300,000
6. Administration			$643,405	1,856,595	2,500,000
7. Maintenance and operation of buildings and grounds			273,595	626,405	900,000
8. Alterations and improvements			291,500	108,500	400,000
Total obligations	4,150,000	2,900,000	1,208,500	28,441,500	36,700,000

[1] The appropriation "Construction of laboratories" has been omitted from this table since it is not a part of the annual program of the Bureau of Standards.

Estimated obligations, fiscal year 1952, by source of financing

Activity	Appropriations for the National Bureau of Standards [1]			Transfers from other agencies	Total
	Research and testing	Radio propagation and standards	Operation and administration		
1. Fundamental research	$758,845	$233,140		$1,008,015	$2,000,000
2. Applied research	764,643	461,190		4,774,167	6,000,000
3. Development	937,040	1,336,916		36,726,044	39,000,000
4. Testing, calibration, and specifications	1,067,807	19,107		913,086	2,000,000
5. General services	621,665	849,647		928,688	2,400,000
6. Administration			$642,008	2,357,992	3,000,000
7. Maintenance and operation of buildings and grounds			275,332	724,668	1,000,000
8. Alterations and improvements			291,660	308,340	600,000
Total obligations	4,150,000	2,900,000	1,209,000	47,741,000	56,000,000

[1] The appropriation "Construction of laboratories" has been omitted from this table since it is not a part of the annual program of the Bureau of Standards.

Senator McCarran. Doctor, is there anything further you want to say?

(Discussion off the record.)

Senator McCarran. I am sorry my colleagues were not here, for your presentation was very enlightening.

Dr. Condon. Would it be permissible to put some additional material on construction of laboratories in the record?

Senator McCarran. Anything you want to put in the record, sir, we will be glad to have.

Dr. Condon. It is just in the nature of detail.

Senator McCarran. Very well. It may go in the record at this point.

(The information referred to is as follows:)

Construction of Laboratories

The appropriation "Construction of laboratories" provides for the liquidation of contract authorization granted in the fiscal 1951 budget of the National Bureau of Standards permitting the construction of new laboratory facilities for the radio work.

Because the situation has changed rather rapidly since the formal budget document was prepared last October, in view of the generous support given by the Congress to another urgent phase of the Bureau's work in the Second Supplemental Appropriation Act of 1951, it may not be amiss to supply for the record a clear statement of the present situation.

The items in this appropriation make provision for carrying out the purposes of two acts of Congress. These are Public Law 366, approved October 25, 1949, authorizing the construction of a radio laboratory building for the National Bureau of Standards, and Public Law 386, also approved October 25, 1949, authorizing the construction of a guided missile laboratory for the National Bureau of Standards.

In the regular appropriation bill for 1951 provision for these was made as follows: For the radio laboratory, $360,000 in cash for engineering design, and $3,915,000 for contract authorization. For the guided missile laboratory, $140,000 for engineering design and $1,760,000 for contract authorization.

In the Senate hearings on this matter for last year (pp. 1524–1526) it was reported that decision had been made to locate the radio laboratory at Boulder, Colo., 35 miles northwest of Denver, in the town which is the seat of the University of Colorado. Subsequently the Department of Commerce, acting for the United States Government, has accepted title to a 220-acre site for the use of the National Bureau of Standards, presented as an outright gift by the citizens of Boulder for this purpose.

The funds available this year have been transferred to the Public Buildings Service which in turn has engaged the architectural firm of Pereira & Luckman of Los Angeles together with the services of Mr. Robert Dietzen, architect, of Boulder, Colo. These architects are now engaged in specific planning of a building which will provide in the simplest and most efficient way possible for the urgent needs of the radio work of the National Bureau of Standards. The amount provided in the budget before the committee is in liquidation of the contract authority and will permit the construction of this urgently needed facility.

In this connection it may be mentioned that, in acquiring the site, provision was made for an adequate tract of land to take care of possible future needs beyond those presently foreseen for the radio work. The wisdom of this step is already in evidence in that emergency construction work on the site is starting at once on a smaller facility in support of some special work which the National Bureau of Standards has been asked to do for the Atomic Energy Commission. These facilities are to be constructed at once on an emergency basis and will be completed and in use before construction on the radio building can start.

The situation concerning the guided-missile laboratory will be more familiar to this committee as it was thoroughly discussed in the House hearings on the Second Supplemental Appropriation Act of 1951 last December (pp. 401 et seq. of the published House hearings). As will be recalled the regular appropriation act was modified as regards this facility, in that the second supplemental act approved a proposed arrangement between the Department of the Navy and the Department of Commerce whereby a part of certain unused facilities in the disestablished United States Naval Hospital at Corona, Calif., would be used for this purpose.

In lieu of proposed construction cost in the amount of $1,900,000 for a new facility, this arrangement is being carried out with a current appropriation of $1,540,000 which is intended not only to provide for necessary remodeling and alterations of the old hospital buildings, but also for basic laboratory equipment and for the costs of moving the personnel from Washington to Corona.

Soon after the passage of the second supplemental act formal arrangements were made between the Department of the Navy and the Department of Commerce for the assignment of a portion of the Corona hospital property to this use. In view of the expressed wish of the Congress that the remainder of the property be kept available for possible hospital use, the buildings assigned for the use of the National Bureau of Standards are not the ones which were planned to be used when original budget estimates for the alterations were made and therefore it now appears that these costs will run considerably higher than was estimated on the other basis.

Shortly after the necessary arrangements with the Navy were made, the National Bureau of Standards arranged with the Public Buildings Service to secure their services in planning, contracting for and supervising the building alterations. This work is now going forward in an expeditious manner and it is expected that the new facilities will be ready for occupancy in July or August of 1951 as originally planned, thereby saving more than a year and a considerable sum of money in providing the facilities needed for effective prosecution of the Bureau's contribution to the Navy's part in the development of guided missiles.

Patent Office

DATA ON PATENT OFFICE FEES

(See p. 619)

Fees established by or pursuant to law for filing of patent and trade-mark applications, issue of patents, sale of patent and trade-mark copies, and other services furnished by the Patent Office produced $5,448,000 in revenue during fiscal year 1950, and are estimated to produce $5,800,000 in 1951 and $6,000,000 in 1952. For these same years, operating costs of the Patent Office have been or are estimated to be $11,023,036, $11,350,000, and $11,600,000, respectively. On the basis of these figures, present fees would have to be approximately doubled if the cost of operations were to be completely offset by revenue.

Eight items of revenue in the Patent Office account for better than 95 percent of total income. These items, the statutory reference for those fixed by statute, the amount received for the fiscal year 1950, and the percent of total revenue are given in the following table:

	Statutory reference	Amount	Percent of total revenue
1. Patent filing fee	35 U. S. C. 78	$2,071,065	38.01
2. Patent final fee	do	1,165,828	21.40
3. Design fee	do	128,400	2.36
4. Trade-mark filing fee	15 U. S. C. 1113	483,975	8.88
5. Trade-mark renewal fee	do	103,720	1.90
6. Recording assignments	35 U. S. C. 78 and 15 U. S. C. 1113.	134,775	2.47
7. Printed copies of patents and trade-marks	do	957,867	17.58
8. Photostat copies of records	None	162,330	2.98
Subtotal		5,207,960	95.58
All other revenue		240,382	4.42
Total		5,448,342	100.00

1 and 2. *Patent filing and final fees.*—The fee of $30 payable on filing an application for patent and the fee of $30 payable before the patent is issued are the two basic fees concerning patents. Both are set by statute (35 U. S. C. 78) and together they account for about 59 percent of total revenue. In addition to $30, the statute prescribes a fee of $1 for each claim in excess of 20 in filing the application and also $1 for each claim in excess of 20 when the patent is issued. The amount of revenue for item 1, patent filing fee, includes $27,075 received on claims over 20 and the amount for item 2, patent final fee, includes $6,048 received for claims over 20.

3. *Design fee.*—The fees for obtaining design patents are $10, $15, and $30 according to the term of 3½, 7, or 14 years requested by the applicant (35 U. S.

C. 78). There is no final fee as in the case of other patents. The amount shown for item 3, design fee, comprises the following three term groups:

3½ years at $10	$34,140
7 years at $15	21,150
14 years at $30	73,110
Total	128,400

4. *Trade-mark filing fee.*—The basic fee for the registration of trade-marks is a filing fee of $25, set by statute (15 U. S. C. 1113). There is no final fee as in connection with patent applications.

5. *Trade-mark renewal fee.*—A trade-mark registration lasts for 20 years and at the end of that period can be renewed for an additional 20 years. The fee for renewal is $25, with a penalty of $5 for a late payment. Penalty fees included in item 5, trade-mark renewal fee, amount to $1,420. Both fees are set by statute (15 U. S. C. 1113).

6. *Recording assignments.*—The statutory fees for recording assignments (35 U. S. C. 78 and 15 U. S. C. 1113) are:

For recording every assignment or other paper, not exceeding 6 pages	$3.00
For each additional 2 pages or less	1.00
For each additional patent, registration, or application included or involved in 1 writing where more than 1 is so included or involved, additional	.50

7. *Printed copies of patents and trade-marks.*—Printed copies of the specifications and drawings of issued patents (except design patents) are sold for $0.25 each. Copies of design patents and of trade-mark registrations are sold at $0.10 each. Prices are set by statute (35 U. S. C. 78, patent and design copies; 15 U. S. C. 1113, trade-mark copies).

8. *Photostat copies of records.*—The Patent Office supplies large quantities of photostat copies of its records and printed publications. The rate is not specified by statute but has been fixed administratively at $0.20 per page.

ALL OTHER REVENUE

The following list shows other fee items for which the Patent Office received over $5,000 during fiscal year 1950:

	Statutory reference	Amount of revenue
Applications for reissue of patents	35 U. S. C. 78	$5,220
Appeals to the Board of Appeals	do	49,200
Petitions for revival of abandoned application and delayed payment of final fee.	do	6,680
Republication of trade-marks	15 U. S. C. 1113	20,600
Oppositions	do	20,275
Petitions for cancellation	do	5,815
Abstracts of title and title reports (statutory in trade-mark cases; administrative in patent cases).	do	18,543
Certification fees	35 U. S. C. 78 and 15 U. S. C. 1113.	12,970
Copies of trade-mark registration or renewal grant	15 U. S. C. 1113	10,333
Drawings and corrections	None	38,744
Subscription service fee—patent copies	None	10,773
Photoprints of drawings	None	5,851
Total		205,004

Revenue from other miscellaneous fees amounted to $35,378.

(Whereupon, at 3:30 p. m., Thursday, April 26, 1951, the committee recessed until 1:30 p. m., Monday, April 30, 1951.)